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The Curriculum

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INTRODUCTION

THIS ISSUE of the *Review of Educational Research* begins the third cycle of triennial reviews in the various fields of educational investigation. Several significant phases of curriculum development have attained a position of increasing importance since the previous *Review* in this field was published in April, 1934. About a score of elaborate studies have been carried out pertaining to the social basis of the curriculum. Extensive experimentation has been carried on with various plans of the reorganization of the curriculum in which broad areas of social experience have replaced the conventional subjects. Activity curriculums are increasing in number and, therefore, studies reporting experimentation and evaluation in this field are included. Surveys of school systems have been added because they invariably include an appraisal of the curriculum.

With regard to the nature and the scope of the *Review*, there is a need for more space for the critical evaluation of research on the topics covered in each number. The majority of the contributors find the output of investigations so large that it is impossible to include an adequate interpretative section. There is also a feeling among a number of the contributors that the *Review* should be limited to a smaller number of the most significant investigations.

The authors of the section on science and mathematics, deliberately restricted the number of investigations to emphasize relatively few significant studies. This should serve as a useful basis of comparison between the comprehensive treatment represented by most of the chapters in this number and the more limited treatment in science and mathematics.

Research tendencies and needs—The sociological investigations of the last two decades have not resulted in the anticipated socialization of learning. Investigators can cooperate with teachers in setting up lifelike learning situations for experimentation and evaluation. In a number of new fields such as consumption, progress is retarded because of the lack of research in accumulating literature of learning activities. In several chapters of this issue the tendency toward integration is reported. Research can help us to discover its societal basis. There is a tendency to study large learning situations instead of fragments. This is reflected in the number of analyses of human experience into broad areas. There is a need for studies leading to the development of a sequence of courses covering the whole period of elementary and secondary education in accordance with the stages of child development. Students of the curriculum will continue to devote themselves to the discovery of a social direction for the American school.

Curriculum trends—An analysis of the literature of curriculum research gives us a clue to some of the more significant broad trends in curriculum development. These follow:

1. Intensive studies of social and economic life are being undertaken in order to determine the direction of the American school. These are summarized in Chapter I and receive incidental treatment in several other chapters.

2. There is a tendency to consolidate related subjects in the secondary school.

3. There is a tendency to organize learning around broad areas of human experience such as *recreation*.

4. The two preceding tendencies are phases of the integration of learning which is given special attention in several chapters.

5. There is a trend toward making learning socially useful.

6. There is a tendency to develop improved methods of evaluating the direct and indirect results of learning.

7. There is evidence of a strong interest in the reconstruction of the curriculum of higher education.

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Committee on the Curriculum.

CHAPTER I

Social Basis of the Curriculum

RECOGNITION OF THE NECESSITY of building a frame of reference is one of the most clearly discernible trends in current thinking about programs of curriculum development. This is most commonly formulated in a preliminary period of study lasting from several weeks to a whole year. This step frequently includes a general survey of contemporary social, economic, and political life. Sometimes it involves an analysis of the contributions to education of all the basic sciences. In a number of instances the period of preliminary study was devoted to a social and economic survey of the region for which the new or revised curriculum is intended. In all instances much emphasis is put on social change. At the present time there is much concern over the meaning of democracy, since it is universally accepted that its preservation presents one of the greatest challenges to education today. The purpose of all these analyses is to discover a new social direction for the curriculum.

During the three years covered by the present cycle of the *Review of Educational Research* a great quantity of literature has been written concerning the social basis of the curriculum. From this output only such treatises have been selected as show evidence of prolonged, thorough, and objective investigation. In many programs of curriculum development basic facts concerning societal conditions have been drawn from other fields of knowledge. These have consisted of analyses of recent social trends (14), and studies of current economic conditions (8, 9, 13).

With regard to method, the studies examined analyze the social scene by means of authoritative treatises on present and past national life. They are frequently documented from outstanding scholarly analyses of political and social life as well as from contemporary periodical literature. They derive some of their principles from leading political theorists. They all start with basic assumptions as to the nature of the public welfare, examine modern conditions of living, find them wanting, set up desirable goals, and conclude with certain educational recommendations.

Investigations Made by National Committees

The Committee on Social-Economic Goals of the National Education Association (11) spent several years studying the best available data for the purpose of restating the goals of public education in the United States. The report is brief. It lists ten desirable social-economic goals of America and their implications for education.

Watson (18) analyzed the means of conserving human resources and presented a program in which the school plays an important role. Among other aspects of life he included a consideration of health, recreation, citizenship, communication, occupations, home life, and consumption.

Commission on the Social Studies in the Schools

The *Conclusions and Recommendations* of the Commission on the Social Studies of the American Historical Association (1) summarized the results of five years of study by a group of scholars and their assistants. The volume included a frame of reference based upon examination of American society and its trends, and the systems of social thought. The Commission took the position that the central problem of our age is the control of our economic resources in the interest of the masses of people, and that the major responsibility of education is to make an intelligent transition to a cooperative social order. The recommendations included a program of learning activities and methods of teaching.

Counts and others (2) made a report to the Commission on the role of education in the social process. The data, which are both historical and contemporary, were concerned with the forces which have shaped American life and the major social trends. These furnish the background for an educational philosophy and a school program. Confronted by the necessity of formulating a plan of action, he admittedly threw off the mantle of investigator and selected the most fundamental social trends, among which is a socialized economy presenting an enormous task of mental as well as institutional reconstruction. Since the collective trend is inevitable, the author maintained, it remains for us to keep it within the democratic tradition.

Merriam (10) affirmed that the economic and social phases of democracy will undergo important integral changes. Therefore, the greatest need is adequate training for adjustment to changing conditions. Although primarily concerned with the development of a social theory of administration, Newlon's study (12) is very intimately related to the social basis of the curriculum. He pointed out that we are in the midst of a period of revolutionary change and are moving toward a form of collectivism within the framework of democracy. He concluded with a formulation of educational and administrative policies consistent with a coherent social philosophy.

Studies Made by Individuals

Rugg (15) contended that the building of a better social order can be accomplished within the scope of a democracy. He made a synthesis of the principal strands of American culture as a background for understanding the impasse which confronts organized social life today. He suggested some characteristics of a curriculum which will help young America to set up a humane method of distribution of the plentiful products of our magnificent system of production. For the purpose of discovering the social direction of the changing curriculum, Everett (3) made a study of the American social heritage and the conditions of contemporary life. He took the position that a modernized democratic life should be developed by means of constitutional change. The goals of democratic life were formulated and, finally, the educational implications were pointed out.

French (4) proposed an educational scheme for a planned democracy. Basing his study on social trends, he foresaw a more equitable system of pri-

vate enterprise. He proposed a curriculum closely related to the social environment. On the other hand, Langford's social analysis (7) led him to conclude that our system of private enterprise is a failure. Therefore, it is the function of the curriculum to help the workers to build a new socialist economic order. The instructional proposals illustrate how the several subjects may be given a proletarian emphasis.

The most painstaking effort of a school system to make a broad social analysis as a basis of curriculum planning is that of the Virginia State Department of Education (17). This is particularly significant because it was followed by a series of similar analyses of varying degrees of intensity and breadth made by other school organizations (6, 16). These efforts are reported here because they represent a certain amount of pioneering study which may eventuate in a radical reorganization of the learning program of the American public school. While the procedure is not technically described, the product contains unmistakable signs of an elaborate study of social theory and social trends which yields a new curriculum framework of major social functions which form the core of the work of every grade. The particular aspects of major social functions studied in each grade are based on the developing age interests.

The investigators in the Breathitt County, Kentucky, program (5) secured authoritative opinion and information by conferences, correspondence, and visitation, concerning the various resources, needs, and opportunities of the area. These were supplemented by information from public documents, and other sociological and economic publications. On the basis of these data a new curriculum with special emphasis on guidance was formulated. This was followed by several years of experimentation with an indigenous school program. This is a good example of a regional survey as a basis of a regional educational program. Unlike most of the studies reported in this chapter it did not concern itself with conditions basic to the social order. These were taken for granted, and the curriculum itself goes no further than local rehabilitation.

The foregoing analyses of social life and thought yield several curriculum goals: the preservation of civil liberties and other aspects of the democratic way of life; the creation of a readiness for social change; the improvement of the standard of living; the discovery of the machinery for a more equitable distribution of an abundant national income; adjustment to increased socialization of economic life; the development of a closer relationship between school and life; and a more extensive use of the community as a laboratory for learning.

CHAPTER II

Plans for Curriculum Building and Research

Plans for City Programs

TRILLINGHAM (55) STUDIED the organization and administration of curriculum programs in 100 cities. He found that 93 percent of the cities had programs which he classified in three types: (a) those which create new curriculums; (b) those which revise and adapt old curriculums; and (c) those which do both. Details of organization such as direction of programs, selection of workers, and cost were studied. The data in the study will be found helpful in developing the details of a plan for curriculum improvement. Little assistance is given in evaluating the effectiveness of one type of plan as contrasted with another.

Harap (32) reported the administrative tendencies in curriculum programs as revealed by an analysis of more than 300 courses of study. Committee procedure, he found, is almost universal. Production committees are always found, and general or central committees are a fairly common occurrence. Classroom teachers continue to play the leading role in curriculum making.

Parker (49) made a critical analysis of the organization employed by various school systems for curriculum development. He considered the point of view dominating the plan of organization, significant aspects of current practice, illustrative types of organization, and suggested improvements.

A number of plans used in particular cities are available. The plan employed in Wilmington, Delaware (56:13-92), has four steps: (a) a study of need, (b) preparation of teachers, (c) production of materials, and (d) study of outcomes. A study of pupil interests (56:93-99) employed in carrying out the plan was reported. Argo (22) outlined the procedure employed in the Sequoia Union High School to shift from a more or less incidental plan of curriculum building to one of a more definite and aggressive type. Krey (39) described a plan based on the recommendations of the Commission on the Social Studies of the American Historical Association. Brewton (24) reported the plan of the Louisville, Kentucky, program which placed special emphasis on the in-service training of teachers. Aldrich (21) discussed the organization and procedures employed in a cooperative program among the schools of St. Louis County in developing a revised social studies curriculum.

Plans for State Programs

No comprehensive studies of plans for state programs of curriculum making are available. A considerable number of reports have been made on particular programs. Plans may be classified in three general types. One type emphasizes stimulation of local schools to undertake curriculum improvement. Central committees work on common problems such as scope and aims, and encourage and aid experimental efforts. Results of such work are

made available throughout the state. The California state program for secondary schools, reported by Hepner (35) and Douglass (28), is of this type. The report of the Committee on Scope and Sequence of the Major Learnings in the Curriculum (29) is illustrative of research activities and committee reports.

A second type of state plan gives greater emphasis to the development of a systematic program for the state as a whole. Local initiative is encouraged and general participation is the basis of this type of program, but guidance materials of considerable uniformity and, ultimately, courses of study are produced for the state. The steps in the Mississippi plan (45:8-9) are illustrative of such a program:

> The first year will be spent on study, analysis, and discussion of our present program and of our educational needs.
>
> During the second year, the teachers of the state will be encouraged to make exploration into new materials and new procedures. These materials will be appraised and organized by state committees.
>
> The work of exploration and expansion will be continued during the third year, and, at the same time, materials previously collected will be put into the hands of selected teachers to be tried in practical classroom situations.
>
> A further extension of the use of new materials by all teachers will be encouraged in the fourth year.
>
> During the fifth year, materials will have been selected from the work of the preceding years as being of special value to all teachers in the state, will be made available on a statewide basis, and teachers will be aided in their use.

Research activities in plans of this type are conducted both by special research committees and by production committees. Illustrative of such a study is *Areas of Human Activity and Problems of Life* (46) made by a special committee to aid the Mississippi state committee on scope.

A third type of plan emphasizes the production of courses of study in a relatively short period of time. General teacher orientation is not emphasized, although wide participation in the production of course of study materials is usually sought. There is little opportunity for research activities other than those which production committees carry forward as a specific part of production work. The North Carolina plan (48:7-8) is illustrative of this type of approach, as is suggested by the following statement:

> Material is to be produced to go directly into the course of study. The year is essentially one of production, the study being intended to make production as immediately valuable and usable as possible. The "set up" in this bulletin is designed for that purpose. The entire approach has that in mind.

A number of states (31, 37, 40, 53), in addition to those already mentioned, have outlined in special bulletins the plans of their programs with directions and suggestions for carrying them out. The preparation of such guidance materials is one of the significant developments in state programs of curriculum improvement.

Emphasis on Experimental and Exploratory Procedures

The North Central Association Commission on Unit Courses and Curricula and the Progressive Education Association Commission on the Second-

ary School Curriculum have sponsored plans which involve the development of cooperative experimentation by individual schools. Ryan (52) reported the general nature of certain of the experiments; Aikin (19) described the general plan of the work; and Stonecipher (54), Cook (27), Patin (50), and Gaffney (30) reported experiments as developed in individual schools.

State programs of curriculum development are emphasizing experimental and exploratory work by local schools and the tentative character of published materials. The Texas program (53:16-17) stated as a guiding principle that "the curriculum revision program should be conceived as an experimental program." The Mississippi program (44:12-13) has as one objective the development of an experimental program in secondary schools. The California program (35) is based primarily upon experimentation in local school systems.

Plans employed by some cities are in marked contrast to highly centralized programs. The Los Angeles plan (26) employs an exploratory and experimental technic. "Every effort," it is reported, "has been made to avoid that authoritarian approach generally characterized by intensive planning and preparing in research offices of detailed, logical outlines of subject matter. . . ." Ten Chicago high schools have developed a plan of cooperative experimentation (41). Starting with a small number of pupils and teachers the work has been rapidly extended. The State Department of Public Instruction in Michigan employs demonstration research centers as a part of the state plan of curriculum building (33).

Emphasis on Orientation

Plans generally place emphasis on orientation of teachers to the problems and procedures of curriculum improvement. State programs especially have emphasized this. Special bulletins were prepared during the period under review to guide this phase of the plans in Texas (53), Mississippi (45), Kansas (37), Georgia (31), Alabama (20), Louisiana (40), and North Carolina (47). A research committee at the University of Michigan made an analysis of curriculum development in Michigan schools to assist in orientation of curriculum workers (38). Lay orientation was emphasized in several plans. The Michigan plan (42) employed lay leaders in developing a statement of goals for public education. The Mississippi (43), Arkansas (23), and Kansas (36) plans provided bulletins to guide parent-teacher association study groups.

Emphasis on Teacher Growth

Recent programs (25, 49, 51, 56) are stressing more and more utilization of the same technics of learning in the curriculum development program as teachers employ with children. It is held that teachers can improve the curriculum only as they broaden their insights, deepen their interests, and improve their technics. Consequently, emphasis is placed upon voluntary participation, democratic procedures, provision of varied experiences which

contribute to the growth of teachers, and curriculum changes which emerge from the classroom.

Needed Research

There has been almost no effort to evaluate the outcomes of various types of plans. Trillingham (55) secured opinions on the general value of curriculum programs, and Henderson (34) reported the judgment of teachers as to the influence of participation in the Virginia state program on their attitudes and work, but no studies have been made to determine the outcomes of particular types of procedures. Studies of the outcomes of lay and teacher participation, of the influence of exploratory and experimental centers, and of the results of using various types of curriculum materials would greatly aid in developing more adequate plans for curriculum improvement.

CHAPTER III

Reorganization of Subjects

RESEARCH dealing with the reorganization of subjects may be considered as including studies involving the consolidation of subjects, the integration of subjects, and entirely new organization of pupil experiences. This chapter will be limited to a review of the research during 1934 through 1936 in elementary and secondary education. Research in this field takes two general forms: (a) studies leading to or describing the reorganization of the basic form of the curriculum, and (b) evaluation of the results obtained in basic reorganization.

From school situations within the period there has come a wealth of descriptive material telling of departures from conventional practice and rough evaluation of new procedures. Although much of this experimentation does not go beyond reports of what happened, such experimentation has nevertheless shown itself to be of value in that it represents a systematic method of inquiry which enables teachers to understand better the nature of the educational process and to guide the process more intelligently and with less routine.

A more "scientific" type of research is recorded in those studies which utilized control groups, standardized objective tests, and established statistical procedure to appraise certain outcomes of the learning process. This second type of curriculum research is in its initial stages due to the fact that the outcomes most valued by educators sponsoring fundamental curriculum reorganization are to a large extent as yet unmeasured by scientifically developed measuring instruments. Therefore, this type of research has had to wait upon the development of instruments to measure interests and attitudes, habits and study skills, abilities involved in interpreting data, abilities involved in applying facts and principles to concrete situations, the evaluation of sensitivity to significant problems, pupil initiative and pupil cooperation in the educational process.

For convenience, curriculum reorganization of the type here discussed may be classified in three non-exclusive categories: (a) merger of subjects into broad fields, such as social studies and general science; (b) organization of pupil experiences around functional areas and problems, such as health, recreation, transportation, and beautification of communities; and (c) organization of experiences around the activities, interests, and present needs of the learner.

Broad Fields

The emphasis within the triennium under review has been upon the development of numerous courses of study, especially in the social studies and general science. Such courses may be conveniently located by consulting lists of best courses of study compiled by Herbert Bruner and staff, and published annually in the *Curriculum Journal.*

Descriptions of experimentation in the integration of subjects are illustrated by the reports of Featherstone (63), H. E. Brown and his associates (58), and Fulcomer (64). W. Brown and Compton (59) presented a valuable description of what goes on in integrated-type classes. A list of principles for successful integration of subjectmatter areas resulted from experimentation in the University School of Ohio State University (76).

Lee and Root (72) reported an experiment in which three junior high-school classes utilized a three-period session in which social science, English, and art were integrated around social science units. On objective tests there were no statistically significant differences between the experimental and control groups. Stinnet (79) presented evidence that youngsters were interested in a fusion unit in the social studies on problems in democracy; the method of eliciting data, however, casts doubt upon the reliability of this evidence.

Functional Areas and Problems

Descriptive material illustrating the functional type of organization was that of Everett (62) concerning work integrated around a CCC flood control project and of Williams (85) on the Norris School Cooperative. An interesting series of examples of socially-centered curriculum experiences was reported by Hanna (67). Ryan (77) reported a functional type of curriculum, following the organization developed by a committee of the North Central Association (80), in the areas of health, community living, use of leisure, and vocations. A challenging example was that set forth by the Virginia state course of study (83) which was based upon an analysis of the major functions of social life.

Research basic to this type of curriculum organization was carried through by the staff of the Lincoln School (61) which made a study of the American scene. Birmingham schools (57) undertook an analysis of their community preparatory to curriculum revision. The Georgia State Department of Education (65) made a survey of community resources in curriculum building.

Weathersby (84) reported that a group in the lower six grades of the Mississippi State Teachers College Demonstration School, which followed a social-function curriculum, exceeded the norm on the New Stanford in literature and language usage, but, strangely enough, fell beneath the norm in geography, and history and civics. Unfortunately, the data needed to calculate statistical significance were not presented. Larsen (71) declared that a somewhat similar curriculum in the McKinley High School, Hawaii, was successful in that the group was up to par on standard achievement tests and that disciplinary problems became less frequent. Detailed evidence was not presented.

Child Activities, Interests, and Needs

Outstanding descriptions of curriculums based upon child activities, interests, and present needs were reported by Gustin and Hayes (66), the correlated handwork bulletins of the Chicago schools (60), the Wilming-

ton cooperative curriculum revision report (86), and the Pasadena suggestions to teachers in guiding pupil experiences (74).

Research basic to this type of program was Sanguinet's study (78) of the life activities of Philippine boys and girls in the seventh grade, in which a selected group of teachers evaluated the activities listed by a selected group of children. Symonds' investigation (81) of the life problems and interests of adolescents was one attempt to supply data relative to the needs of American boys and girls.

On the basis of objective tests Leining (73) reported that a fourth-grade group in the Lincoln School gained more in knowledge of science after a unit based upon the scientific interests of children than did control groups. Harap and Mapes (68, 69) reported that groups taught by the activity programs gained considerable mastery of arithmetic procedures. Taylor (82) likewise presented data regarding the superiority of activity programs to drill in the learning of arithmetic.

General Quantitative Studies

There have recently appeared several studies of experimental schools where there have been various types of curriculum organization, which, although they fall within the scope of this report, cannot be readily classified on the information given.

Hopkins and Mendenhall (70) made a study of the standard test scores of the Lincoln School, in which from 40 percent to 60 percent of the class time was given to experiences built about child interests and needs. After correction was made for the high I.Q. (median, 119.47) of the students, they achieved above norm on the Stanford in reading and social studies, and below norm in arithmetic and spelling. Differences were slight. Hopkins and Mendenhall pointed out that the outcomes measured by these tests were not those most sought by the Lincoln School. The results showed merely that in a school which devoted a major fraction of its time to a curriculum based on child activities the students gained the knowledges and skills valued in a subject-centered curriculum.

Two studies reported by Wrightstone (87, 88) gave attention to certain of the outcomes stressed by progressive educators—ability to work, to organize materials, to interpret facts, to apply generalizations, and the development of liberal attitudes. Using matched pairs of pupils, drawn from three pairs of equated public school situations, he found that in no case did the subject-centered schools show a statistically significant superiority to the experimental schools in any field other than quantity of recitational activity in classrooms, whereas the schools with various types of reorganized curriculums displayed a significant superiority on tests of civic beliefs, recall of physics and chemistry facts, science beliefs, literature acquaintance, honesty (self-marking test), emotional adjustment (Woodworth-Mathews inventory), recall of literature facts, working skills, ability to interpret facts, and knowledge of plane geometry.

At the present time there is under way a thoroughgoing research into the value of the new curriculum organization. Under the direction of the Commission on the Relation of School and College, of the Progressive Education Association, an eight-year experiment involving evaluation of the achievements of some thirty experimental high schools is being undertaken. The research staff is now developing instruments to measure the degree to which the schools are attaining their objectives. Especially interesting is the fact that at the 1936 summer institute (75) the developing of research instruments went hand-in-hand with the developing of new materials for the curriculum in mathematics. This type of coordination between research workers and teachers represents a desirable and more healthy relationship than has existed in the past.

Summary

As yet there has been no comprehensive, clear-cut study of the effects of various forms of curriculum organization. Also, there have been few basic studies of the type needed if teachers are to be adequately prepared to rebuild the curriculum with an understanding of the problems and needs of our society and its children.

While it is hoped that the "cut-and-try" methods of curriculum experimentation will continue to be productive, scientific skepticism demands that the curriculum of the future be increasingly based upon the types of fundamental research mentioned above and that the curriculum be more and more tested objectively to see whether it is producing its desired outcomes, even though objective evidence can never hope fully to supplant evaluation by the subjective judgment of trained educators.

CHAPTER IV
Curriculum Investigations

A. Art

THE PAST THREE YEARS have seen a change in types of research in art, from the measurement of abilities and interests to the examination of qualitative aspects of the art experience. Curriculum workers have become increasingly concerned with the development of total and integrated personalities of growing children, and with the development of curriculum materials coordinate with individual and group needs in a changing social world. The result has been the exposure of structural and psychological differences between the traditional and newer coordinated types of art curriculums. General educators, artists, and laymen have entered the discussion with critical and provocative appraisals. The present report has confined itself to findings pertaining to significant trends and influences. Two previous reports, with bibliographies, were made by Garrison (111,112) and dealt with methods and psychology of art in elementary, high-school, and college groups. Questionnaire studies to find student responses to art courses, made by the Federated Council on Art Education (109), and art preferences made by Traill and Harap (144), furnished materials pertinent to the curriculum worker. D'Amico (104, 105) surveyed art teaching in high schools of the United States, and found many forces inhibiting creative art growth in children—especially those of departmentalization and the "skills-technics" emphasis.

Art and society—The adaptation of the art curriculum to a changing world was the plea of Haggerty (114) and Counts and others (102). They further agreed that values in art education were not to be sought for merely in terms of fun, enjoyment, and leisure time. Whitford (146) suggested a threefold approach: free-creative expression, knowledges, and appreciations in meeting presentday demands, with an emphasis on child development. Calhoun (98) pointed out contributions made by art to social understanding between two sections of the nation. Munro (127) emphasized the cultural objective for art education with attendant contributions "to normal, well-balanced development of personality, ability to make necessary social adjustments and to achieve discriminating enjoyment of life."

Art and the creative experience—Continued emphasis and study have been made in reference to the creative experience. Mearns (123), Dewey (108), and Meier (125) found creativity common to many, rather than a few. They maintained that everyone is a potential artist, while Fox and Hopkins (110) placed all learning and solution of novel situations in the category of creation. Dewey (107), in an exhaustive treatment of the topic, established that the esthetic experience is common to all people. Mursell (128) attacked the mechanistic view of cause and effect as an adequate explanation of the creative act. He would think in terms of total personalities polarized in a certain direction.

Art and integration—Closely connected with the agreement that art is creative has been the problem of providing an art curriculum that fosters it.

Two groups (90, 150) reported accounts of art teaching experiences bearing on this problem. Various forms and uses of art in integrated programs have been reported by Plaisted (134). Mursell (128) warned that integration of art with social studies may have unsound psychological foundation, and advocated careful consideration of more closely relating the arts. Munro (127) shared the same view and reported a graded program of comparative arts for museum classes of children. In cooperation with the Progressive Education Association, thirty high schools are experimenting for an eight-year period with integrated curriculum materials. Findings from this project should suggest new approaches and content for high-school curriculums.

New spheres of influence—Out of the economic depression new forces have emerged, strengthening and vitalizing art in the present society. It is to these forces that art educators may turn for inspiration and suggestion. McMahon (122) and Genauer (113) reported that government participation has revealed a growing indigenous American art. Shapiro (139), Bucklin (96), and O'Brien (132) presented new uses and recognition of art by the public. The need for regional art was pointed out by Wood (148). In the Owatonna project, Haggerty (114), Hilpert (119), Ziegfeld (152), and Krey (120) gave accounts of the initiation and procedures of finding new curriculum materials from the art needs of a small community. School cooperation in other community art projects was reported by Hanna (115), Henderson (117), and Chrisby (99). In Delaware (106), the arts served to enrich the lives of adult groups and Bryson (95) found an increasing cultural emphasis in programs for adult education.

The First American Artists' Congress (89) revealed immense social and cultural potentialities of the artist group. Wright (151), Rothschild (137), and Wood (149) have in their individual ways interpreted the function of art to the layman and the educator. The Museum of Modern Art (129, 130) sponsored the study and preservation of American foundations of modern art through exhibits, lectures, and publications in which bibliographies have been included. La Follette (121), Mumford (126), Cox (103), and Cahill and Barr (97) focused attention on the status of American art and conditions receptive to its growth and function.

Two new and powerful mediums have presented themselves in the forms of radio and motion pictures. Two outstanding radio contributions were reported by Cahill and Barr (97) and Coomarswamy (101). Television may open up a new avenue of art instruction.

It seems evident that the kind of scientific treatment of educational problems, so successful in other fields, is less adaptable to analysis of the art experience. Fallacies appear when art tests lack real art quality, when creative ability is determined from materials prescribed by others, and when abstract, analytical considerations are asked of elementary-school groups. Perhaps the art educator may find more appropriate technics in the biological sciences.

Since art has begun to broaden its activities and project itself as a real life force, it is of paramount importance that greater emphasis be placed on its

educative and cultural values. New technics and materials for instruction need further investigation, especially for institutions preparing teachers for the new art curriculum. Comparative studies of art teaching and curriculum materials require adequate criteria for their evaluation.

Further research and experimentation are much needed in such fields as, community resources and needs for art, related arts curriculum, cooperative school and community art projects, uses of radio and motion pictures in art teaching, creativity—its nature and nurture, diagnostic and therapeutic uses of art, new uses of art in contemporary living, art curriculums for preschool and adult groups, uses of government participation in art education, the artist as teacher, and creative art in an integrated curriculum. Findings from these areas of research should enable the art educator to proceed with greater knowledge toward the construction of a rich and effective art curriculum.

B. Music

With the limitations of space, source, and time placed upon the writer, it is impossible to review adequately the many fields of music research of importance to music education. It was necessary to eliminate such topics as music therapy, ear pathology, synthesia, sound localization, speech and language studies, illusions in the field of sound, studies dealing with accoustical values, measurements made on animals with musical stimuli, kinesthetic and sensory experimentation, and a number of other divisions in which valuable work has been done. No thesis material could be included and all studies dating back more than three years were ignored. Nevertheless, more than a score of important contributions to music education research are here listed. They deal chiefly with tests and measurements, nationality studies, inheritance, music administration, the vibrato, the analysis of performance, good vocalization values, vocational guidance, conducting, and methods of acquiring skill. These studies are discussed in alphabetical order.

Bartholomew (153) studied the oscillographic records of sixty males and females to determine the values which contribute to good voice production. Brown made a few valuable studies of importance to piano pedagogy. Practice with hands together and separate, as it affects speed of learning and pleasure in learning, was reported in one study (155). In another, the touch method of learning piano music was used (154). Chadwick (156) attempted to determine the probable success in music from scores earned on music talent tests. Densmore (157) made a study of the Indian music along the Gulf states. Dexter (158) showed how pitch discrimination and French accent are related. Drake (159) described four new tests of musical talent. Ewing and Littler (160) made a study of auditory fatigue and adaptation. Farnsworth and others (161) investigated the tempo consistently associated with the waltz and with the fox-trot by university students. Farnsworth (162) attempted to determine whether music capacity tests were more important than intelligence tests in the prediction of several types of music

grades. A rather unique baton-movement study was undertaken by Giese (163) with the aid of photography. Harriman (164) investigated the relationship between auditory acuity and success in college. Voice and personality were studied by Herzog (165). Hevner (166) extended her appreciation testing into the field of music. A valuable text dealing with the psychology of the audience was written by Hollingsworth (167). This text should be of genuine importance to the public school music teacher.

Husband (168) measured the effects of musical rhythm and pure rhythm on bodily sway. The structure of melodic experience was analyzed by Jaworsky (169). Employing the questionnaire method, Koch and Mjoen (170) investigated the inheritability of musical ability. A series of theses pursued at Syracuse University were reviewed by Kwalwasser (171) and interpreted in the light of what children could teach us about teaching them. Malherbe, Vilenski, and Herman (172) studied the auditory residues of deaf-mutes and the utilization of bone perception. Manzer and Marowitz (173) measured the performance of a group of college students on the Kwalwasser-Dykema Music Tests. Ortmann (174) reported his study dealing with the elements of chord reading in music notation. His notes on recent music research conducted at Peabody Conservatory showed the extent of work done under his direction (175). Two valuable contributions from the pen of Seashore (176, 177) dealt with the psychology of the vibrato and the factors which condition success in performance. Stanton (178) showed how testing scores prognosticate musical achievement. Whitley (179) studied the influence of music on memory.

C. Commercial Education

Secondary schools in the United States—Dewar (203) made a thorough and worthwhile contribution in which he surveyed the occupational conditions in the United States and Boston. Higgins (216) completed another comprehensive piece of work covering statistics in 84 high schools and 22 junior high schools as to the enrolment, graduates, number securing higher education, fitness of teachers, status of administration, curriculum offerings and standards, machine equipment, testing, guidance, and extracurriculum programs. Wiggin (273) conducted a similar study of commercial education in 22 public high schools in Rhode Island and 47 representative business concerns. Selby (256) made an excellent study of the business curriculums in American secondary schools, and formulated a program for the education of secondary-school students preparing to conduct small independent enterprises, including needed text material. Pennell (244) studied curriculums, organization of courses, instruction, and guidance practices available to commercial students in Michigan high schools. C. C. White (271) surveyed business education in 141 rural public high schools of California, supplemented by data from previous national and state surveys and recent government bulletins. Lord's investigation (225) embraced answers from 4,333 firms and personal interviews with business men in an attempt to determine whether or not pupils are prepared to meet successfully the problems con-

fronting them upon entering the usual business occupations found in the vicinity. Bradshaw (184) studied business education in the secondary schools of Montana, and Barringer (182) did the same thing for the public schools of Idaho.

Junior colleges—Shields (260) conducted a study of commercial education in the junior colleges of the United States, in which he gave a clear statement of what is being offered as well as suggestions for the improvement of business curriculums on this level. He presented a real philosophy of junior college business education. Wall (268) investigated business education offered in the junior colleges of Utah, and Woodman (279) analyzed the educational and economic background of this type of institution.

Follow-up study of graduates—Burton (190) made a follow-up study of commercial graduates of the Wausau Senior High School, Wausau, Wisconsin, which is an excellent example of a city survey. Trentham (265) investigated the commercial graduates of the Southwest Missouri State Teachers College and the non-commercial graduates of the same school, covering a period from 1925 to 1932, inclusive. The comparison was made between these two groups of students when they entered the college, when they graduated from the college, and when they had been out of college for certain periods of time. Approximately one-half of the commercial graduates had done some graduate work.

Cooperative training—Woodbridge (278) determined the values to be derived through the establishment of cooperative training in collegiate courses in merchandising, based upon replies from eighty inquiry blanks sent to chairmen of departments of merchandising in all the colleges of the United States that offered courses in merchandising; he supplemented this investigation by library research, personal interviews, and letters from specialists in the field. Shaw (258) made another study to determine the status of cooperative business education in public secondary schools, showing the extent of training, aims, curriculum organization, and teacher qualifications.

Survey of duties of city directors—Burmahln (189) analyzed the duties of thirty city directors of business education in the United States—the total number of such directors at the time of this investigation. These duties were evaluated with reference to the teachers; pupils, equipment, and buildings; selection of textbooks; surveys, reports, and recommendations; community activities and educational publicity; general administration and supervision. In general, the duties of city directors were found to be exceedingly varied, and there appeared to be very little standardization of performance of these duties.

History of business education—Knepper (220) made a complete history of commercial education in the United States, based on a five-year study of original and other sources of information regarding the evolution of business education from Colonial times to 1920. Towle (264) studied the history of commercial education in Boston schools, covering commercial education in the general high schools, the High School of Commerce, the Boston Clerical School, evening commercial work, cooperative courses in salesmanship,

and the continuation schools. Woldow (276) conducted a similar historical study of commercial education in the Philadelphia high schools from 1837 to 1933.

Bookkeeping and accounting—Childs (195) presented evidence to justify vocational bookkeeping classes in the high schools of Detroit. A study by Granberg (209) showed the aims, enrolment, curriculums, texts, methods of teaching and testing of bookkeeping, based on questionnaire responses from 175 high schools in the state of Washington. McNeil's study (231) presented a history of bookkeeping in the schools of the United States and European countries, treating aims, teaching methods, approaches and content, teaching personnel, and bookkeeping machine practice. McNiven's thesis (232) represented an examination of the dividend practices of representative American corporations, to determine the extent of variation in such practices. The writer concluded from his study that certain basic principles do exist and should be followed by any corporation wanting to use the best methods of determining its dividend policy. Nelson (236) studied the accounting practice for shares of no-par-value capital stock issued by industrial corporations organized under the laws of Delaware, Maryland, and New York to provide a factual basis for a course in collegiate schools of business dealing with no-par-value shares. Skene's study (261) showed an analysis of bookkeeping activities involved in business occupations for the purpose of providing a basis to determine what bookkeeping learning activities should be included in the secondary-school curriculum. These bookkeeping activities included those for consumers as well as for persons who will pursue bookkeeping as a vocation. Van Valkenburg (266) made a questionnaire study of 250 secretaries to determine the bookkeeping activities carried on by them. Youngwood (280) evaluated the content of required accounting courses in four New York City collegiate schools of business, with reference to their adequacy for training business executives as shown in the accounting activities of 250 executives in the New York metropolitan area.

Consumer business education—Haas (212) made a study of consumer needs in business based upon a detailed analysis of student and adult buying habits and buying errors. This material was organized into a course of study on consumer education for business. While the sequence of details in the course was determined subjectively, it did make the materials more useful for the classroom. Lee's study (223) embraced a checklist of consumer business activities presented to 673 intermediate grade pupils, as well as a survey of courses of study and textbooks.

General business training—Anderson (180) determined the status of curriculum enrolment, aims, and courses of study, based on questionnaire responses from schools in Washington, Oregon, and California, and supplemented by a survey of literature and visits to schools. Brown (188) listed three levels of concepts and abundant source materials. Colvin's study (198) represented a determination and an evaluation of twenty-eight kinds of information about commercial occupations that are found in textbooks and syllabi, including those of elementary business training, used in a repre-

sentative group of public secondary schools in this country. This investigation revealed that the courses in elementary business training give very little attention to the teaching of the twenty-eight kinds of information about commercial occupations. Robinson (251) attempted to point out the value and necessity of general fundamental information regarding business training for the academic as well as business student. Rouchleau (253) investigated general business information needed by 1,982 ninth-grade pupils in seven schools of Los Angeles, California.

Law—Green's study (210) is an outstanding contribution. She attempted to answer two questions: Should law be taught in public high schools? If so, how can it be made of interest and value to high-school pupils? Attention is given to the place of law in the curriculum, aims and objectives, values, content, correlation, methods of vitalizing subject, teaching procedures, lesson plans, and testing.

Office practice and clerical training—Heidrich (215) investigated among 100 adult students, the number of office workers who actually use certain bookkeeping, shorthand, and typing skills, and the various kinds of office machines; he supplemented this study by tabulation of seven previous related studies. Loso (226) studied the status of office practice in the public senior high schools of New Jersey. He found, among other results, that office practice was required of all commercial students in 74 percent of the 77 schools which reported on this item. There was, at the time of his study, a very apparent lack of standardization in the nature and requirements of this course. Nichols (240) reported on the measurement of results of teaching clerical units of training to nearly 500 high-school seniors. He discovered an abundance of evidence that unless pupils for clerical courses are carefully selected and adequate time is given for such work, no appreciable degree of occupational competency can be expected to result from teaching. J. D. White (272) analyzed duties of office workers as a basis for curriculum reconstruction.

Shorthand and secretarial training—Byram (191) examined textbooks used in required freshman courses in California higher institutions of learning in an attempt to make a list of 6,000 words to be used in a course in personal shorthand during the senior year of senior high school. Mart's study (234) is based on information obtained from thirty-seven recognized authorities on the teaching of shorthand, relative to the place of the course in the curriculum, time devoted to it, technical skill required of teachers, materials used, and standards of achievement. Nichols (239) made a careful analysis of secretarial duties to determine what distinguishes a secretary from other office workers, with a clear presentation of the personal traits which seem best calculated to qualify one for secretarial work. The study is based on the judgments of a large group of successful personal secretaries and employers of secretaries. A study made by Osborne (242) indicated that many college students use shorthand and typewriting in their school work. Quayle's study (247) of 124 women stenographers revealed problems of adjustment which may be attacked through the curriculum. Conclusions

show the necessity for a personal guidance program in the school; one of the most serious lacks of "unhappy" stenographers is an almost complete absence of an adequate plan or goal. The study made by Vietti (267) dealt with the historical development of shorthand systems other than Gregg.

Social economics—Brewington and Knisely (186) compiled an important bibliography on the social concept of money, as found in many school subjects; various services and periodicals; and government publications. The study by Brandenburg (185) comprised examination of four textbooks on economic geography, with suggestions for revisions. Cobb (197) set up a definite list of economic-citizenship concepts. McKay (230) endeavored to determine the essentials of a course in the elements of business at the senior high-school level with particular reference to social-economic understandings. Wills (275) interpreted certain developments in business education in the light of current economic conditions.

Typewriting—The study by Johnston (218) offered some good suggestions on teaching units which need more emphasis. The study by Price (246) is useful for determining items inadequately taught. D. Robertson (250) investigated relative value of factual materials as typing textbook drills to be used in the learning process. Wilder's study (274) showed that a course in typewriting stimulates students to do more writing and better writing. Wollenhaupt (277) stressed trait activities commonly disregarded.

D. English Language and Grammar

So significant have been various investigations in correlation and integration in the last triennium that a separate discussion of them is included in this section to supplement the four categories previously developed: curriculum and supervision, usage, elementary English, and secondary English.

Curriculum and supervision—Two committee reports of the National Council of Teachers of English and a third report based on a study of the Psychological Institute in cooperation with the English Council form the main body of curriculum advance for the 1934-36 period. *An Experience Curriculum in English* (295), begun in 1929 and published in 1935, represented the united efforts of over 100 leading teachers and supervisors of the nation. The sections related directly to language and grammar are Part IV, Creative Expression; Part V, Communication; and Part VI, Corrective Teaching. As its name implies, this curriculum draws its organization from "experience strands." Each major phase of the course is divided into three to eight such strands. Creative Expression, for example, has three strands: observation, imagination, and reflection. Grammar is introduced under the heading of Language Technics in each of the strands. The section on Corrective Teaching includes usage, spelling, reading, and speech. Barnes (283) commented rather briefly on *An Experience Curriculum.*

The other National Council publication, *A Correlated Curriculum,* will be treated under "Correlation and Integration." O'Rourke (311) reported on a nationwide survey of usage errors. His purpose was to accumulate evidence for rebuilding the English curriculum to insure greater mastery of

essentials. Data were obtained from standardized form tests distributed to participating schools. The conclusions presented a list of usage items in the sequence in which they may be most effectively taught, and indicated that by limiting instructions to those essentials of usage which make up the list, presented in the order proposed, English-usage instruction should be greatly improved. This report was criticized by Aiken (281). O'Rourke (312) also commented on his survey prior to the publication of his complete report.

The committee on research of the National Council (316) discussed research contributions to teaching and curriculum making appearing in print between January, 1933, and July, 1934, with some emphasis upon correlation. The role of English in supporting curriculum unity of design, normalization, and correlation was pointed out by Lyman (303). While advocating ungraded or loosely graded courses of study in composition, Cutright (287) developed criteria for the teacher in the ungraded program. McMillan (306), after writing a general history of English as a school subject in America, established five characteristics of the newer courses of study. That English becomes vital only as the drive from within the pupil replaces the drive from without was the theme of Sperlin (317), who went on to divide the study of English into five general classifications. Hovious (297) discussed such general trends as the revolt against the rules of grammar.

Integration and correlation—A Correlated Curriculum (322) represented a crystallization of theory, experiment, and practice in correlation. It discussed and presented samples of curriculums of six types: (a) correlation of English with other fields through incidental references and isolated projects; (b) an English course based on correlation with other subjects, but not implying the modification of courses in any other field or the cooperation of other subject teachers; (c) the fusion of English with one other subject; (d) the fusion of groups of subjects; (e) a curriculum based on the integration of all educational subjects; and (f) a curriculum transcending subjectmatter divisions. It also proposed eight tests for judging the value of correlation.

At one extreme on the question of the place of English in the integrated curriculum stood Featherstone (291), who held that English may disappear entirely as a separate entity, with provision made for teaching literature, language, and functional composition and grammar in the social sciences. Much the same conclusion was reached by a summer session research group at the University of Arkansas, reported on by LaBrant (300), which decided that English functions best in cooperation with other departments rather than as a separate organizational classification.

Bishop (284) stood diametrically opposite, holding that the real solution for integrated effort lies in "a cross-section of school activities within the English department," and rejecting a telescoped integration of English with social science or art. English as "the core of integration" was the theme of Neville (308), who would use English to supplement all other activities without giving up the organized English class.

Symonds (318) showed the importance of cooperation in successful correlation, pointing out that a single teacher cannot be expert in all of the correlated fields. He regarded English as holding a place accessory to the content subjects which are to make up the core in integration. The usual correlation of composition and literature was, to him, no more intrinsically logical than a correlation of composition with any other subject. That any foreign language, considered both as an art and a treasury of human thought and experience, can effectively be integrated with English was the contention of Roberts and Kaulfers (315).

Cooperation, as distinct from integration, was discussed by Lincoln (302) in a curriculum planning situation, and by Vincent (319) in describing an effort for the improvement of language usage.

De Boer (288), though opposed to the abandonment of class instruction in English, deplored the "vested interest" spirit which resists change. The development of social solidarity through horizontal integration in the elementary school must be supplemented by vertical integration in English if the products of English teaching are to be worthy of preservation in the secondary school, according to Holmes (296). Alvey (282) discussed two types of procedure in building composition courses around functional centers. Both the New York syllabus (310) and the Virginia state course of study (320) gave outstanding correlation experiments.

Usage—Although no comprehensive usage study, with the exception of relevant portions of the O'Rourke report (311), has been published in the triennium, the trend toward usage consciousness is apparent in professional and even lay literature Rice (313) entered his plea for "easy" English, in which both the stigma placed upon "colloquial" vocabulary and the aura surrounding "formal" English are removed.

Creation of a demand for textbooks based upon usage was urged by Marckwardt (307). Usage was also championed by Walcott (321) as the proper basis for grammar study, and much the same view was held by Weersing (323). Newsome (309) set up a five-point scale of grammar values to aid teachers in determining what grammar is functional from the usage standpoint. The usage point of view was developed for non-professional readers by Aiken (281). Keener (299) quarreled with certain conclusions of the late Sterling Leonard's *Current English Usage,* charging statistical laxity.

Elementary English—Greene (293) presented as major problems in elementary English curriculums: (a) complexity of the language itself; (b) absence of adequate practice and usage authority; and (c) difficulties in way of identification of basic skills. He suggested as solutions the establishment of adequate objective authority for selection of significant and acceptable practices, more adequate and complete data on oral language usage, and the determination of which of many variations in skills actually carry the load in social usage. A concise review of the most valuable research studies in elementary language, grammar, and composition during the decade 1924-34 was the contribution of Guiler and Betts (294).

Goodykoontz (292) answered four questions pertaining generally to content and organization of elementary English curriculums and to provision for individual differences. She included a bibliography of elementary English courses of study in language and composition. More intelligent distinguishing of mechanics and content phases in composition was urged by Duboc (289). Durrell (290) emphasized initiative and self-direction as the final objectives in language teaching, and stressed the necessity for adjusting rate of learning to the individual child. Crawford and Royer (286) described an investigation which showed that oral drill was slightly more effective than grammar study in correcting specific language errors. Significant new texts for teachers in elementary-school language were those of McKee (305) and Jenkins (298).

Secondary English—Since the discussions of correlation and integration have reference for the most part to secondary English, few contributions remain to be reviewed in this section.

Lyman (304), after advocating evolution and reasonable experiment rather than revolution and abandonment of well-established practices, discussed four curriculum innovations. Two of these—recreational reading and functional composition—have become established practice, but the others—a limited grammar program and the correlation of literature with other subjects—are not yet past the experimental stage. An experiment in separate high-school English courses for "academic" (college preparatory) and "general" students, based on the supposed preference of the first group for ideas and of the second for people and things, was described by Cline (285). Leonard (301) discussed the Virginia course of study in secondary-school English.

E. Handwriting

No major pieces of research in the curriculum in handwriting have been found in the literature of the period covered by the present volume. Such studies as bear on the topic directly or indirectly will be summarized briefly.

The general impression many people have that the quality of handwriting in the schools has fallen off during the past generation was confirmed, so far as it went by Tenwolde's comparison (333) of the writing of a small group in 1935, 1912, and 1879. The deterioration is probably real, and the explanation should be sought.

The characteristics of nine textbooks in handwriting in the light of a set of criteria adopted by the authors were tabulated by Melbo and Waterman (331). Although the criteria were largely based on opinion, they provide a useful basis for comparison.

An attempt to evaluate various forms of the capital letters by laboratory experiment was made by Boraas (325). His measures were speed of production, "deterioration" after prolonged writing, and legibility. General conclusions from a detailed study of four letters were applied to the rest of the alphabet, leading to the recommendation of a set of simplified forms.

The place of handwriting in an activity program is of interest to the proponents of such a program. Nystrom (332), largely on the basis of general experience, agreed that motivation should grow out of the child's experience, but maintained that systematic practice is necessary. She inferred some of the main features of writing from a comparison of the procedure followed by good and poor writers.

The effect of learning to use the typewriter on the writing of children in Grades II, III, and IV was studied by Conard (327) with mixed and therefore inconclusive results.

A number of studies, mostly minor and incidental, dealt with the desirability of manuscript writing. Freeman (329) reviewed and interpreted the experimental literature on the subject, suggesting manuscript for beginners and cursive for older pupils. Conard (326) also reviewed the studies in a semi-popular article. Goetsch (330) attacked the question of whether using manuscript writing in the primary grades and then switching to cursive writing affects unfavorably later cursive writing, by comparing cursive writers in the middle grades who have followed this course with those who have used cursive from the beginning. He found no significant difference.

The experiments have stressed the benefit of manuscript writing chiefly in the primary grades. Cutright (328) presented new data to indicate that it improves reading and spelling in these grades. Beatty (324) argued that it is also superior for older children and adults. He cited illustrative evidence on speed and quality but gave no complete data or tables.

F. Reading

During the three-year period from 1934 to 1936 inclusive, approximately 325 scientific studies relating to reading were published. In the summary which follows only those studies which relate more or less directly to the curriculum of reading as a school subject will be considered. Studies relating to other types of problems, such as reading in the content fields, the psychology and methods of teaching reading, reading tests, diagnosis and remedial procedures, are considered in other issues of this publication.

The pre-reading curriculum—Much emphasis has been given recently to the fact that a pre-reading curriculum is essential which will prepare pupils for more effective participation in early reading activities. Yageman (366), for example, cited opinions and the results of studies indicating that first-grade failures are due in part to the fact that reading is often introduced before pupils are sufficiently mature to learn to read easily. This point of view is further supported in reports and original studies by various contributors, such as Wulfing (365), Smith and Jensen (353), and Witty and Kopel (362). One solution proposed for the genuine difficulty pointed out is that reading should not be introduced until pupils reach a certain chronological or mental age. Indeed, various investigators, of whom Thomson (355) is an example, showed a distinct reduction in failures as a result of postponing reading.

Gates and Bond (340) cited evidence which indicates that the difficulties which pupils encounter are not removed merely by delaying the teaching of reading for one or more terms. They believed that available data "emphasize the importance of recognizing and adjusting to individual limitations and needs before and after the beginning of reading rather than merely changing the time of beginning reading." The validity of this view is clearly supported by the results of a study by Waters (361), who provided experiences based on the content of the selections included in the beginning readers, before specific instruction in reading began. Interest in this problem is further exemplified by the recent monograph by Harrison (343), entitled *Reading Readiness*, which considers both the factors influencing reading readiness and the nature of the instruction which fosters it.

Reading as a separate subject in the curriculum—As a result of a survey by the Research Division of the National Education Association (349), it was found that 99 percent of the school systems which cooperated reserved definite periods for instruction in reading in Grades I and II; 97 percent, in Grade III; 94 percent, in Grade IV; 93 percent, in Grade V; and 90 percent, in Grade VI. It is obvious that the vast majority of school systems believe that some form of systematic teaching of reading is essential.

Organization and time allotments for reading—The survey (349) referred to above revealed three types of reading periods. About 37 percent of the teachers whose practices were summarized had class periods which provided opportunity for recitations, study, and free reading. This type of reading period was reported with about equal frequency in each of the first six grades. The average amount of time devoted daily to reading periods of this general pattern varied from ninety-six minutes in Grade I to forty-five minutes in Grade VI. "In Grade I, about half the time is devoted to recitation or group reading; in Grade VI, about one-third of the period. Supervised study shows the opposite trend." A second type of class period, reported by 31.7 percent of the teachers, "consists of a class period in which recitation and study are combined, but with special periods for free reading or other special reading activities." A third type, reported by 31.6 percent of the teachers, "involves a series of separate periods, each set aside for a particular kind of reading activity." As a rule, these periods were from twenty to thirty minutes in length, "regardless of grade level or type of activity involved."

Characteristics of ten beginning reading systems—The fact is well known that the reading curriculum in the early grades is determined largely for many schools by the system of beginning reading used. In a comparative study of ten such systems, Cooper (336) examined their underlying philosophies, essential equipment, manual suggestions, the vocabulary, and related items. His findings revealed more similarities than differences in the systems studied. Basically, all harmonize with the 1925 recommendations of the National Committee on Reading. The present tendency is for authors

to be guided in the choice of both reading material and methods by the needs and interests of the pupils.

Selection of sixth-grade readers—During recent years the California State Curriculum Commission has adopted an analytical approach to the study of the relative merits of books under consideration for adoption. As characterized by Waterman and Melbo (359, 360), the plan involves "(a) the development of a set of criteria by which the books may be judged; (b) the formulation of a score card based on the assignment of numerical values to the items of the criteria; (c) the completion of a series of studies, primarily objective in character, designed to secure data with respect to the relative merits of the books on all the criteria; and (d) the interpretation and utilization of these data in rating the books on the score card." The investigators presented a detailed analysis and scores for each of six sixth-grade readers. On the basis of the evidence secured, they concluded that the authors and publishers of reading textbook materials "have apparently agreed rather well on the general nature of a basic sixth-grade reading text."

Relative merits of two types of work materials in first-grade reading—Pierce and Quinn (351) compared the value of "work-book" and "picture dictionary" material with respect to (a) increasing the pupils' reading vocabulary, and (b) convenience in administration by the teacher. They found that each type of material has advantages. The work-book type acquaints them with an important type of reading (following directions) and provides a variety of activities. On the other hand, the picture dictionary material "provides effectively for the recognition of words and phrases." Apparently when different types of material are under consideration, the most pertinent issue to raise relates to the specific contributions, if any, which each makes to a well-rounded reading program.

The vocabulary of reading—Widespread interest has been expressed during the last three years in various types of vocabulary problems. The importance of the adequate mastery of a basic vocabulary was emphasized by Dolch (337), Rickard (352), and Stone (354), the first two investigators proposing basic vocabularies for beginning reading, and the last proposing one for the second grade. Vigorous criticisms of the vocabularies of primers and first readers were pointed out by Foran (339) and by Hockett and Neeley (344). Foran reported that words of lesser importance are frequently emphasized, that the vocabulary used is often not based on children's interests, and that words are introduced very rapidly without sufficient repetition to insure retention. The very large vocabulary of readers and juvenile books commonly used in Grades III to VIII inclusive was emphasized by Thorndike (356, 357, 358), who recommended the use of simpler material and the better control of the vocabulary in children's books. As an aid in determining what words children might reasonably be expected to know at the various grade levels, Buckingham and Dolch (335) carried on an extensive investigation resulting in a combined list of 19,000 of which "over 10,000 are given grade placement according to children's usage by one or more studies."

Curriculum provisions for individual differences in reading—During recent years many investigators, such as Bigelow (334), Persons (350), Durrell (338), and Worlton (364) have presented striking evidence of the wide range in reading ability among pupils at each grade level. As a means of providing more adequately for such differences, various experiments have been carried on which required specific curriculum adjustments. For example, Gibbs (342) modified the work in a high-school English course to provide pleasurable experiences with books adapted to the needs and interests of the pupils; MacLatchy and Beavers (348) selected different reading procedures in order to adapt instruction to three general levels of progress represented in a sixth-grade class; Lamoreaux and others (347) reported that teachers in three classrooms selected a content field (social studies, science, or arithmetic) and developed daily reading lessons for groups at three levels, namely, the fourth, fifth and sixth grades; Gatto (341) reported the use among high-school pupils ranking below the seventh-grade norm in reading ability of a series of twenty lessons based on material of a factual type chosen from the fields of history, geography, science, and civics, and providing specific practice in twelve reading skills. In each of these experiments, notable improvement was secured in the reading ability of the pupils. Such findings emphasize the importance of curriculum adjustments to meet the reading needs of pupils.

Curriculum implications of reading interests—With the increasing tendency to adapt curriculum materials to the varying interests of pupils, the results of studies of reading interests assume large importance. The fact that pupils who rank low in mental ability do have reading interests was shown clearly by Hockett (345), who studied the interest appeal of 64 books for 400 boys and girls in Z classes in Grades IV-VI inclusive. Teachers should make special effort to discover such interests in selecting materials for use in reading classes. The extensive reading done by gifted children justifies Witty and Lehman (363) in recommending that the school can greatly enrich these children's experiences by providing them with opportunity to read the best of the books that are appropriate at their respective age levels.

G. Spelling

Due to severe limitation of space, this review notes only what are apparently the more important published studies in the field of spelling. Several published investigations have been omitted. Many unpublished but important studies have not been listed, although they have been used in building comments presented herein.

Selection of words—No significant studies of words used most frequently and universally by adults in writing have been reported. However, Anderson (370), in comparing the writing vocabulary of literary men with that of average adults, reported that the former used a larger vocabulary and were better able to employ words appropriately in terms of shades of meaning. These data should be helpful in the selection of marginal words.

Published and unpublished investigations have been made of the words used most frequently and universally by children in writing. Driggs (376) tabulated the vocabulary appearing in a small number of letters written by upper-grade children. Fitzgerald (377, 379) reported the vocabulary of a large number of letters written outside the school by intermediate-grade children. When one adds to these data the vocabularies obtained in several unpublished and similar studies of children's letters written at all grade levels, and the vocabularies obtained in recent and unpublished studies of children's writing in schools where the right sort of a course of study in written composition is employed, the total data available on children's writing vocabulary are well over 2,000,000 running words. With an understanding of the invalidity of the earlier studies of children's themes in mind, an examination of the compilation of these recent investigations of children's writing shows that we are really just beginning a valid discovery of the words used most frequently and universally by children, and that the writing vocabulary of children is much larger than we have anticipated. This latter discovery is important to the teaching of both spelling and reading.

Although Fitzgerald (378) obtained interesting data on the amount of agreement and disparity between his word list and Horn's adult list, there is reason to think that such comparison is premature, and will so remain until the words used most frequently by children have been determined. Contrary to the opinion of some, the facts on the relation between the words used most frequently by adults and those so used by children are not at all clear.

A few investigators gathered data relative to difficulty as a criterion in the selection of words to be taught. Fitzgerald (377) reported the difficulty of words used by intermediate-grade children in writing letters. Garrison (381) and Wise (399) secured data on the difficulty of certain words at upper-grade levels. Unpublished studies were concerned with incidental learning taking place in connection with other school activities, thereby indicating simple words that possibly may be dropped from the course of study; with words now included in the course of study that are seldom misspelled; and with words that are learned with a minimum of effort. Unfortunately, no investigations of the cruciality or the permanency of words as factors in selecting spelling vocabulary have been reported.

Grade placement—Wise (398) reported that twenty-nine modern spelling texts vary widely in the grade placement of words included, as well as on the inclusion of words to be taught, and that frequency was apparently the dominating criterion in determining grade placement as given in these texts. Data gathered by Fitzgerald (377) and Wise (399) may be used as an aid in determining grade placement in terms of difficulty. More important than these data, however, are those resulting from unpublished studies of the learning difficulty of certain words, and from similar studies of words that are too simple or too difficult for given grade levels under conditions imposed by the present level of teaching efficiency. Data collected by Fitzgerald (377) and by authors of unpublished studies of children's

writings at all grade levels provide the best available information relative to grade placement in terms of the child's present use of the word.

Methods—In comparing a weekly plan with a daily plan of teaching, Gates and Bennett (382) found no significant superiority attached to either. Gates and Graham (384) discovered that a plan using various games and activities with words had no superiority over the usual plan in terms of learning to spell. However, most pupils involved preferred the plan using word activities. Almack and Staffelbach (367) reported success in securing individual improvement in spelling in compositions. The same investigators (368, 369) summarized certain studies relative to the character and place of pronunciation, syllabification, the teaching of meaning, rules and diagnosis, and remedial teaching in spelling. Further description of remedial teaching was given by Lanier (389). Cutright (374) found that pupils who wrote print-script possessed a larger writing vocabulary and made fewer spelling errors than did pupils who wrote in cursive form. Gilbert (386) discovered that upper-grade pupils learned to spell certain words incidentally through reading. Improvement in spelling ability from grade to grade in a high school where definite instruction was not given was reported by Gilbert and Loofbourow (385). Kelley (388) found no high value attached to any one of five technics used in testing the pupil's knowledge of the meaning of a word. Data relative to the difficulty of handwriting in spelling and to the relative difficulty of letter formations were gathered by Hanson (387). Ogle (393) found the test-study procedure to be superior to the study-test plan. Williamson (397) announced the discovery of seven important factors in learning to spell. In two extensive experiments concerned with generalization and transfer, Gates (383) found that the use of rules and grouping of words did not increase ability to spell words studied, but did increase somewhat the ability to spell new words. In reporting a series of experiments as well as digesting several previous studies, Watson (395) stated, among other things, that (a) class work in spelling practice should be largely omitted as uneconomical at least in the higher schools; (b) pupils should be taught efficient technics for self-teaching of their individual words; (c) the correct use of certain rules is desirable; and (d) homonyms are more advantageously taught together in contrast than in isolation. Watson's report also included material that is important in training in word recognition in reading, and a detailed set-up for diagnosis of spelling disability. It is regrettable that her discussion included misinterpretations of statements of previous investigators, and that some of her conclusions are entirely too general.

Testing—Dewey (375) reported evidence showing that one commonly used standard spelling scale is invalid. Capron (373) found that the order of arrangement of words in tests had no significant effect upon scores made by pupils in the upper grades. Northby (392) stated that five different types of tests vary in validity in terms from the purpose for which they are used. Nelson and Denny (391) reported that the multiple choice test ap-

parently has more merit than is commonly thought. Weller and Broom (396) presented data on the validity of six types of spelling tests.

Research bibliographies—Foran (380) presented reviews of important studies of various instructional problems. From time to time, Breed (371, 372) has prepared brief digests. McKee (390) reviewed all important investigations relative to selection, grade placement, and methods made up to 1933. Waterman and Melbo (394) used summaries of research in the attempt to evaluate spelling texts.

H. Foreign Languages

Method—Hagboldt (419) compared beginners' test scores after a quarter's work in elementary college German with graded reading texts to the norms in grammar and reading for two years in high school and two semesters in college. Oxley (439) summarized studies of "intensive versus extensive" methods. Peters' attempt (443) to compare the achievement of small groups taught by the direct and the grammar-translation method yielded nothing specific. Wolfson (464) experimented for two terms with a "reading method" in French, establishing the superiority in total score of the experimental group, despite higher scores in grammar by the control group. Wrightstone (466) investigated the effect of method on two groups each of junior and of senior high-school pupils, the test scores in both cases being highly favorable to "newer-type practices."

Vocabulary and idiom—Skinner (456, 457) studied in two articles the vocabularies of 45 Italian textbooks—20 grammars and 25 reading texts. Of nearly 20,000 items, about 3,000 which are listed are common to 10 or more books. The vocabularies of beginners' grammars vary widely with respect to the resulting list.

Park (440) ascertained that from 61 percent to 87 percent of the Spanish vocabulary in periodicals and in *Zaragüeta* falls among Buchanan's 2,000 most important words. Phillips (444) compared the vocabulary (5,869 different words) of 10 children's readers used in elementary schools in Spain with Buchanan's *Graded Spanish Word Book,* finding: that 45 percent of the reader words appeared only once; that 80 percent appeared 4 times or less; that about 17 percent of the words in the primers are not in Buchanan's book; and that 52 percent of the primer vocabulary is found in only one book.

Blair (402) studied the vocabulary difficulty of 25 German reading texts for students who were supposedly familiar with the *Minimum Standard Vocabulary* accepted by the American Association of Teachers of German in 1934. Hohlfeld (422) set forth the nature of the "Minimum Standard Vocabulary for German." Ortmann (438) compared 12 German word lists, fixing on 400 items as the nucleus of a list for first year. Schuster (450), assuming that pupils are familiar with Purin's *Standard German Vocabulary,* investigated the comparative order of difficulty of 6 German reading texts. Sharp (454) tested the vocabulary of the *Graded German Readers* with reference to the minimum standard

German vocabulary, and found that some 240 items remain to be introduced in a third set of readers. Wengraf (462) studied the vocabulary, idioms, and cultural information in 100 German songs. About one-third of the 2,103 different words were not listed either by Morgan or by Purin; about half the 160 idioms were not listed by Hauch; the cultural material harmonized with the New York City syllabus.

Bell (401) compared, with inconclusive results, the entries in Vander Beke's *French Word Book* with those in Thorndike's *Teacher's Word Book* in order to determine the "differences of ideas" in French and in English. Hendrie (421) found that 89 percent of the words encountered in 3 French literary texts were listed in Part I and the first 2,000 entries of Part II of Vander Beke. Johnston (428) found that the first 100 entries in Cheydleur's *French Idiom List* are basic for teachers and textbook writers. Mullins, Stone, and Reed (434) concluded that the difficulty of a literary selection cannot be arrived at by a statistical procedure based on vocabulary, idioms, and sentence length. Rosselot (447) studied the vocabularies of one pictorial and two phonographic systems in French, with reference to speech vocabulary. Fewer than one-third of the total number of words are common to the three systems, showing wide disagreement on the ingredients of a minimum speech vocabulary. Salters (449) studied the vocabulary of 6 French novels to determine the order of difficulty with respect to vocabulary, assuming that readers are familiar with the first 3,000 items in the *French Word Book*. Shane (452) estimated the growth in knowledge of French words: first-year active 765, passive 2,715; second-year active 1,185, passive 2,985; third-year active 2,160, passive 3,945.

Age of beginning—Nelson (435) investigated relative achievement in French in two years of junior (eighth and ninth grades) and in one year of senior high school, concluding in favor of the junior high-school group. O'Neil (437) compared attainment in French in first-year senior high school by pupils (a) who had had a year in junior high school, and (b) who had taken no French. Test scores were almost equal for (a) and (b). Previous Latin seemed better preparation for French than previous French. Rubel (448) concluded that the study of French in junior high school has a beneficial effect on a knowledge of English vocabulary. Finch and Floyd (413) concluded that chronological age is unimportant for predicting the success in French of superior pupils.

Cultural material—Huth (426) found the two-year college course deficient in cultural information, and advocated raising the cultural level of teachers. Kavkewitz (429) summarized studies on the means and materials available to promote knowledge of French culture, based on an investigation carried on in New York City high schools. Parkhurst (441) tabulated under six topics the cultural information contained in 24 nineteenth- and twentieth-century French texts. *Cyrano de Bergerac,* for example, contains 164 historical references and 139 items bearing on folkways. Venn (461) reported the scores made on a French cultural test by two similar groups

of French and non-French students, the former group being definitely superior. Goodwyn (416) evaluated the cultural material in 11 Spanish grammars, 5 readers, and 4 novels. Geographical and historical "statements" dominate in the textbooks; geographical "mention" in the novels.

Grammar—Garland (415) ascertained the judgments of 290 foreign language teachers and of English teachers on the relative importance of grammatical phenomena. The two groups were largely in agreement, especially on the importance of terminology. A table listed 55 items valued highly by both groups.

Bouvard (403) ascertained and tested the grammatical items to be taught students to facilitate reading French in a two-year high-school course. N. B. Richardson (446) administered a diagnostic French grammar test to 270 second-year high-school pupils in two states, and to 200 freshmen entering college with two years of French. Scores on the different items showed no change in relative order of difficulty for first- and for second-year pupils. Grammatical proficiency was low. Shonfeld (455) investigated the importance of subjunctive forms in German, concluding that they are much more prominent in the opinions of teachers and in school grammars than in reading texts or in college entrance examination board and regents examinations.

Selection of reading texts—Sharp (453) investigated the standing among German critics of the German books read in school and by the public in translation in the United States. Most of our high-school texts are held in low esteem. The 25 German authors recommended by the critics are virtually unknown in school circles here and to the reading public.

Reading—Koischwitz and Hurd (431) experimented with an "interpretative reading method" in German, a procedure utilized for simplifying a non-literary reading text.

Vocabulary testing technic—Stalnaker and Kurath (459) administered two controlled tests in German vocabulary, using a "best answer" and a "context" technic and concluded that the latter yielded a somewhat higher reliability coefficient.

Prognosis—Brock (405) concluded that "mental age" has the best prognostic value for Spanish, and that poor spellers in English who also have an I. Q. below 100 should be excluded from the subject. Michel (433) summarized studies in prognosis and reported an investigation which indicated that high-school marks have more predictive value for success in German than the various prognostic instruments used. Keener (430) investigated the relative predictive value for success in French of elementary-school records and of a term's work in the language. First-term grades in French showed that 93.5 percent of the total group could be promoted to second-term classes, whereas of a second larger group, admitted to French on the basis of elementary-school grades, only 76 percent passed the first term's work.

N. B. Richardson (446) experimented with the Symonds Prognosis Test with 137 modern language pupils, and assembled all the necessary

data to accompany such an experiment. The test scores had higher predictive value than percentile ranks in an intelligence test, but did not succeed in fixing a dead-line in terms of prognosis test scores. Pupils with previous experience in one foreign language have a better chance of success in a second.

Placement—Cheydleur (408) investigated the operation of new-type tests for placement and of the Wisconsin Intermediate Knowledge foreign language tests, with two groups of 2,301 and 2,096 students, respectively. Ninety-six percent of the students, advanced by a semester or more on the basis of placement test scores, attained semester grades of "C" or better. Seibert and Goddard (451) found that objective placement tests (vocabulary, grammar, composition, and aural comprehension) are valuable for sectioning college students on the basis of attainment and for predicting the quality of first- and second-semester grades.

Transfer—McGoldrick (432) investigated 1,131 bilingual pupils studying a third language, and concluded that monoglots have a slight advantage. Jansson (427) studied the relationship between the ability to discriminate between speech sounds and learning to read Spanish. Training in the one ability had little or no effect on progress in the other. Spevack (458) investigated the value of a knowledge of Yiddish on progress in German. The initial advantage of students knowing Yiddish became inoperative by the fourth term, but a knowledge of Yiddish did not hinder learning German.

Trends—Brickman (404) studied 26 beginning German books, published from 1910 to 1935. He found a tendency to reduce grammar and vocabulary, to introduce more *Kulturkunde,* and to make room for more reading.

Surveys—Hagey (420) surveyed the teaching of French in New York State. Batchelder (400), foreign language teaching in Arizona; Gruenberg (417), the teaching of German in Missouri; O'Meara (436), modern language teaching in Rhode Island; and Pelletier (442), the supervision of French teaching in New York State.

Latin

In a survey of Latin teaching Eddy (411) found that while teachers paid "lip service" to functional methods, actual classroom procedure was largely formal. The omission of questions on formal grammar from the examinations of the college entrance board (beginning 1935), and the appointment of a research committee by the American Classical League may change the picture. Hutchinson (425) outlined a program of research.

Carr (407) found the vocabulary burden of Caesar, Cicero, and Virgil to be 1:14, 1:12, and 1:10, and of so-called easy Latin readers to be even higher in three of the four examined. Hutchinson (423) pointed out the wide variation in choice of vocabulary, syntax, and inflections in fourteen first-year texts. With frequency lists in vocabulary and syntax available, this variation is neither necessary nor desirable. Examining 10,000 words

in classical prose and verse, Diederich (409) discovered that only 37 endings occurred three times or more. Seventeen of these accounted for 67 percent of the occurrences and were successfully used as the inflectional basis for extensive reading in Latin. In the construction of frequency lists of forms and constructions from an analysis of 12,000 running words in four second-year books, Strain (460) found that 33 forms accounted for 91.3 percent of the 2,931 verb occurrences. Studies by Hutchinson (423, 424) indicated that frequency of occurrence of forms, constructions, and vocabulary in high-school Latin does not correlate closely with their difficulty.

Controlled experiments by Wilmoth (463) and Wrightstone (465) showed no significant difference in reading ability between students trained by a non-grammatical, functional method and those trained by a formal grammar method. Carr (406) cited an experiment showing a correlation of .35 between comprehension of Latin and translating English into Latin, and .65 between comprehension and recognition of forms. Futch (414) found no significant relationship between the eye movements of 27 ninth-grade students in reading Latin and the comprehension of the Latin read.

Studies by Douglass and Kittelson (410) and Ellis (412) indicated that Latin students have a slight advantage over non-Latin students in acquiring an increased knowledge of English vocabulary, forms, and spelling.

Gummere (418) reported the progress of 24 superior students who in four years accomplished a full year's more work than an ordinary class.

I. Health and Physical Education

Research in health and physical education has extended its variety and depth. The studies which have been made have generally contributed to a further definition of the similarities and differences which mark these two areas. Administratively they may function as one field, but in objectives, content, and outcomes they are rapidly differentiating.

Health education—General surveys of curriculums have been the subject of at least three studies. J. F. Rogers (498), investigating hygiene instruction in colleges and universities, described such trends as the decline in hygiene teaching in colleges for women, the improved instruction in teachers colleges, the general increase in time spent, and the decrease in the size of sections over the last 100 years. He also indicated that faculty members of the higher ranks predominate in teaching, and that the lecture method is used in 25 percent of the institutions. Among the subject areas most usually covered are mental hygiene and sex hygiene, although the study lacks complete data on content. Sullivan (506) and Ruef (500) investigated curriculums and administration in representative school systems to determine that there is little standard practice in such matters. The content of the curriculum in the first eight grades was suggested by Charters, Smiley, and Strang (474) from an analysis of vital statistics, health surveys, accident statistics, and 20,000 questions from students. This study appeared in text form. A rather complete exploration of the

rural health situation with significant implications to curriculum construction was undertaken by Grout (481), and a practical activity content for rural schools was set forth. Oberteuffer (491), with Edgar Dale and an advisory committee, formulated a six-year curriculum of health instruction for Ohio schools using data collected from vital statistics, current literature, health examination records, hygiene texts, but, principally, 27,000 student questions. Units of study were formed, placed by grades, and correlation opportunities and sources were given with each unit. Criteria for the selection and organization of such learning experiences within the curriculum were also proposed by Oberteuffer (492). Continuing the approach of these studies, O'Neill and McCormick (493) studied the twenty-four hour health behavior of 3,512 elementary-school children to determine their actual needs as a basis for curriculum construction.

Specifically in the college area, H. R. Rogers (497) constructed a course of study for women at the University of Cincinnati by analyzing health needs as shown from physical examination records and from knowledge and habit tests; and Mead (486), by personal visitation and interview, described the curriculums of accredited colleges in New England. Two studies have been made providing data on available health instruction material in other curriculum areas. Rugen (501) and Bechtel (469) reported a great deal of health material found in science, English, and physical education. Jones (482) demonstrated, by means of a knowledge test, that health instruction is better in some urban schools than in rural ones; Salt (503) set forth some health misconceptions and superstitions of seventh-, tenth-, and twelfth-grade students; and Bell (471) showed the need for instruction to college women on certain aspects of dysmenorrhea.

Physical education—No mention can be made here of the considerable and valuable research being done in physical education on aspects other than those relating purely to the curriculum. Three studies have appeared which throw some light on general technic for curriculum construction. LaPorte (483), as chairman of the Research Committee of the College Physical Education Association, has for eight years been at work with a committee to determine specific objectives, the content, methods of instruction, procedures of testing, and standards of administration of a departmental program from elementary school through college. Collins and others (476) emphasized curriculum construction rather than materials in surveying present practice and developing criteria for future growth with a committee from the American Physical Education Association. The Minnesota four-year study (487), now in its second year, plans to improve programs of physical education and recreation in school and community, to develop technics for development, and to provide the basis for improved teacher preparation.

Studies of objectives and outcomes as factors influencing the curriculum have been more numerous. Graybeal (480) reported a most promising experiment at Minnesota to determine measurable outcomes from a required program. Lapp (484) and Cowell (478) investigated certain as-

pects of the social development of pupils as influenced by controlled aspects of play, and the latter, particularly, isolated behavior in physical education characteristic of the "fringer" type or the boy disinclined to enter wholeheartedly into play situations. Evidence that those curriculums which employ the method of practicing game technics in relation to a felt need show better learning outcomes than those which allow for either no practice at all or periods devoted entirely to practice was presented by Rodgers (496). Criteria for evaluating curriculums in relation to their contributions to leisure time were established by Spindler and Dambach (504). Wrightstone (509) evaluated physical fitness outcomes by the use of the Physical Fitness Index. Rowe (499), in making growth comparisons of athletes and non-athletes, showed that boys not in competitive athletics increase more in weight, height, and lung capacity than athletes. His study, it is to be hoped, can be followed by others to throw light on the validity of the place of competitive sport in the curriculum. Tisdale (507) showed the value of corrective therapeutic exercise on body mechanics.

The content of a high-school program experimentally determined at the University School of the University of Michigan was described by Rugen and Saurborn (502), and pupil interests in and attitudes towards the curriculum were studied by Anderson (468), Clevett (475), Montague (488), and Piper (495). To further the continuous development of students on the college level by relating the curriculum there to that which has gone before in secondary schools has long been an aim of college curriculum builders. Evidence regarding this high-school background was supplied by Beise (470), Stuhr (505), Davis (479), and Bullock and Alden (472). These studies indicated, for the most part, that the curriculum of the high school has had a definite influence upon the interests and needs of college students.

The remaining studies in this period pertained to special elements of curriculum content. Palmer (494), for example, reported in a survey of motion pictures in the field of sports, a readiness to use films and a need for evaluation of existing materials. This study is being continued by Palmer and Dale under the auspices of the American Council on Education. The extension of the college curriculum into the community has been treated by Cotteral (477). Altmann (467) has developed curriculum units in physical activity based on group needs. Two activities were given specific analytical treatment—wrestling by Wiggins (508), and hockey by Burr and Saurborn (473). Indirectly, the National Study of Professional Education in Health and Physical Education as reported by the chairman, Neilson (490), touched the curriculum as it suggested basic characteristics of a secondary-school program. Two studies appeared dealing with status of programs and aims. Marshall (485) described few changes in the status of physical education for college women from 1934 to 1936, and Nash (489) compared the aims and purposes of military science and physical education.

Obviously, further research is badly needed on outcomes of various potential curriculum elements. Tradition has too long been the principal determinant of content. By measuring the results of these elements in terms of growth or personality changes in the child or adult student, the reforms, long needed in the physical education curriculum, can be brought about. Integration of all the activities in school and elsewhere bearing upon the physical education of man, particularly as this relates to the correlation between school and community offerings, needs exploration and description.

J. Home Economics

An analysis of the literature over the past three years reporting studies of concern to home economists suggests a slight increase over the previous period in an emphasis on the relation of this subject to other fields of learning and its place in a changing society and a changing school situation. There has been some concern over the relation of the school program to that of other agencies in the community. However, most of the studies deal with home economics as an "individual building block" in the total structure. The investigations reported discuss standards of living, conditions in homes, activities and interests, conditions for learning and school courses, and tests of the results of different phases of the program.

Trends in social life affecting homemaking—Several analyses have appeared of the effects on family life of economic, political, sociological, and technological changes. Kyrk (536) brought together the results of many studies in her *Economic Problems of the Family*. She reported research dealing with incomes for family support; methods of meeting economic insecurity; provisions for unemployment and old age; bases for setting standards of living and for disbursing family incomes; and buying problems of the consumer. Reid's study (547) of the economic problem of household production supplements this. The annotated bibliography by Williams and Zimmerman (561) showed variations in methods of investigation and differences in findings in about 1,500 studies of family living carried on in 52 countries. Zimmerman (565) later, in *Consumption and Standards of Living*, analyzed certain laws of consumption and called attention to the overemphasis on sensationalism, individualism, and conspicuous consumption and the necessity for reappraising values as a basis for spending.

Studies of adjustments required in modern normal families were summarized in Hart and Hart's *Personality and the Family* (527), Cunningham's *Family Behavior* (520), and other recent books. Biological, psychological, and spiritual phases of adjustment were considered and new problems as well as old problems in new settings were evaluated.

The *Journal of Home Economics* has throughout the period printed critical appraisals by economists, sociologists, and psychologists of the effect of emergency and other policies and trends on family life and family relations: the tariffs, social security, housing, food and drug legislation, relief policies, and others have been analyzed. A committee of the American Home

Economics Association (510) has been revising the *Syllabus of Home Economics,* and three sections have been published as tentative: "The Family and Its Relationships," "Family Economics," and "The House."

Present conditions in education—The change in the educational program from formal skills in 1890, through its emphasis on science and art, then economics and sociology, and now philosophy and psychology was traced by Raitt (546) for the country as a whole; over the last twenty years, by Lybarger and Pressey (539); and in one institution from 1869, by Keefer (532), B. M. Davis (522), and Pinney (544).

Besides studying the history of home economics in the Southern states, Kent (534) analyzed the results of planning for home economics education over a fifteen-year period in the twelve Southern states. State plans, programs of work, conference and other official reports were examined. Plans were found increasingly definite and based on needs rather than subjective theory. An orderly, consistent development of a comprehensive program within a relatively short time was found to have developed from careful planning. A higher degree of standardization of the program existed within any one state than in the region as a whole, and more use of the opportunity for experimentation, for keeping records, and for planning with local groups was recommended.

Spafford (553) secured the viewpoint regarding home economics and its educational value from 848 "forward-looking educators." Although college presidents and academic deans were less conscious of its contribution than superintendents and principals, the values accepted by 90 percent of the group and the weaknesses mentioned by others convinced the investigator that administrators were ready to back teachers who want to develop a broad, rich program in this field.

Seven studies dealt with the program for boys. Burnell (517), McAuley (540), and McDougald (541) found a large proportion of the states offering work for boys, and supervisors encouraging it. Harrison (526), Winkler (563), Prebble (545), and Paulson (543) found home responsibilities and activities of boys and men which seemed basic to emphasize in school.

Watt (558), Clark (518), and E. S. Davis (523) studied the programs for teachers of home economics in teachers colleges, women's colleges, and larger universities and colleges. A wide range in courses, in quantity and quality standards, and in sequence existed. There was evidence that social science and courses for enrichment of personal living were not well represented. A survey of the extent of courses in marriage and family relations available in colleges and universities was made by Haworth (528) in 1935; 234 courses were reported, 64 percent of the women's colleges, 29 percent of the men's colleges, and 94 percent of the state-controlled institutions offering them. The departments of sociology, home economics, and psychology give the courses. Their content was determined by Haworth and also by Bigelow and Judy-Bond (512). Fifty-five and two-tenths percent of the 11,532

public senior high schools in 25 states studied by E. Brown (516) in 1934-35 were offering courses in social and home relations.

Science and nutrition courses at the college level were investigated during the period by Hood (529), Bell (511), C. Brown (515), and Todhunter and Sparling (556). The content of chemistry courses for college students in home economics was determined by Hood and Bell through an analysis of texts and references. Both found a very large vocabulary required, with many words occurring infrequently. Hood found a lack of agreement between institutions and within institutions regarding the chemistry content needed by home economics students. Tests revealed a lack of mastery of much of the content taught in one institution. By listing 555 chemistry principles and asking for the opinion of experts in foods and nutrition and chemistry, Bell found some agreement regarding the relative importance of these principles for majors in foods and nutrition and for those who are non-majors. A further vocabulary study of eleven science courses required of home economics students has led one university to experiment with the sequence of courses and with the relative effectiveness of laboratory and non-laboratory courses. The variation in courses prerequisite for nutrition and in credits for these was also shown by Todhunter. These studies have raised serious question regarding the value of opinions and tradition in deciding upon sequences and content of courses.

Bases for selection of content—Few new contributions to activities and interests as a basis for content have been made during the last three years. Teachers rather than research workers have been collecting such data and using them as a basis for studying needs of their groups. The participation of fathers in certain homemaking responsibilities was studied by Dague (521); planning how money was to be spent, keeping expense records, family recreation, care of children, and religious instruction were responsibilities of many of the 300 farmers and professional men studied. The problems of 652 gainfully employed married women homemakers distributed in many income groups and in various parts of the country were found by La Follette (537) to require special emphasis in the homemaking program to help women meet this double responsibility.

Federal emergency funds have been used during the last two years to study conditions and practices in homes. The farm housing survey (548, 549, 554), made through visits to one of every ten homes, showed the potential demand for improved home facilities and some of the inadequacies existing. Wilson (562) has been supplementing this by determining for thirteen areas in the country which differ in climate and living habits the standards for housing and equipment which homemakers feel they need in order to carry on different functions efficiently. Three federal groups have been cooperating in an extensive study (535, 560) of the expenditures of wage-earners and lower salaried workers in selected urban communities, and of farm and village families in other areas of the country. A comprehensive picture of the

standards of living and consumption habits with the relation of different items to incomes is being made available through this study.

Studies of interest and methods of learning—Kellar (533), using Thurstone's technic, constructed a scale for measuring attitude toward any homemaking activity and validated it through checking several types of home activities. The comprehensive studies of interests of adolescents made by M. C. Jones (530) and Zachry (564) seem to be especially worth noting as basic to the curriculum. The problems arising because of the earlier maturing of girls, the drive for approval of contemporaries until a place has been found in one's social group even though school work, cultural activities, and household duties are neglected, and the activities of boys and girls of this age to gain the approval of the opposite sex need to be considered fundamental in planning emphasis in the school program in homemaking.

Brooks (514) and Rockwood (550) have been collecting from college students the problems they consider important as a basis for course content. These and other studies may help adjust content and methods to the drives of college students. Among the important drives at the college level, Snyder (552) believed, are the drive for economic independence, freedom from childish dependence upon the family, adjustment to the opposite sex, and desire to find a point of view about the world which can unify life and give it meaning. Studies helpful in revealing these drives and means of using them effectively in homemaking education are greatly needed.

The question of organization for teaching was dealt with in two controlled experiments in foods classes in high school and one analysis of results in adult classes. The number of subjects was small in each instance and more studies are needed before valid conclusions can be drawn. Comley and C. Brown (519) found the demonstration method as effective with the second foods unit as the laboratory method, and Stevenson (555) found, with the same objectives for the unit, that there were few differences in results by an organization on a meal basis and by an organization on the basis of food requirements, followed by meal planning. Waller and Williamson (557) studied 135 adult homemaking classes in one city, and found time of day offered, length of unit, time of unit, and type of activity as factors influencing enrolment and percent and persistence of attendance. Research is greatly needed to answer questions about methods of teaching, organization of work, and adaptation to various maturity levels.

Evaluation—Tests threw some light on needs of students at different levels and on the extent to which objectives are being accomplished. The efforts in this direction, however, are decidedly limited so far. Food habits were checked by three investigators. All of the studies were limited in scope. Latzke (538) found meals selected by students in a college cafeteria lacking in raw vegetables, fruits, calcium, phosphorus, iron, and Vitamin C. Botto (513) and M. L. Jones (531) compared the food habits of senior high-school girls who had had home economics instruction with those who

had had none. Dietary records did not reveal significant differences between the two groups, one and two years after instruction.

Miner (542) and Gardner (524) tried to determine the effect of high-school home economics work on practices of homemakers. Only slight differences were found in favor of home economics training in foods and clothing practices. Russell's study (551) of judgment ability in art, as measured by the McAdory Art Test, showed that students entering one college had a high average score. Glenn (525) found that students with classroom instruction in art and in clothing in grades, high school, and in college had better judgment than those without, although the test was found inadequate to measure the various objectives thought important. White (559) constructed a test to measure some objectives concerned with house design and furnishing, and found the test tried with 644 secondary-school and college students differentiated between achievement on different instructional levels. These efforts to check results being attained need to be extended to other areas and to be made more comprehensive in scope, in order that emphasis at different levels and methods which are effective may be determined upon a more accurate basis.

In general the studies over this three-year period can be said to be rather scattered in type, and to deal with problems often so small and limited in scope that findings need to be checked by other investigators. Questionnaire and survey methods are used extensively. More objective methods of measuring results and more experimental studies are needed. There has been more concern with specific courses as organized than with studies of changes affecting the family and appraisals of school programs in the light of these, although the last three years show some improvement over the earlier period in this general direction.

K. Industrial Arts and Vocational Education

General curriculum content—The work of the Committee on Standards of Attainment in Industrial Arts Teaching of the American Vocational Association (567) reviewed previously, was continued until December, 1934, when the Committee's final report was made. This report is substantially similar to prior reports and is noteworthy in its grand total of over 1,200 items of subjectmatter which are suggested for boys to master with regard to knowing and doing. The work of this committee has aroused a great deal of curriculum activity, as will be evident throughout this report. *A Prospectus for Industrial Arts in Ohio* (639) suggests materials that should be included in an adequate program for secondary schools. The Evansville, Indiana (659), and the forthcoming Hartford, Connecticut, school surveys offer curriculum suggestions for specific situations. Baker (570) investigated the place given industrial arts by educators in the integrated program of the elementary grades. Fletcher (593) studied purposes, content, organization, and methods in Illinois, and pointed out trends toward increasing emphasis on appreciations, attitudes, and habits. Crawford

(582), Nelson (634), and H. E. Thompson (669) studied problems concerning the effectiveness of visual-mechanical devices in learning. The March, 1934, issue of the *Journal of Educational Sociology* was devoted to papers on problems in vocational education (647). The Nortons (637) examined typical and acceptable curriculum sources and gave a thoughtful and readable interpretation of them.

Background studies with special curriculum reference have been made by Harper (604), Harris (605), E. W. Jones (614), Murphy (633), Pannell (640), Park (641), Trueblood (672), Whitcomb (675), and Wolter (677). Stombaugh (658) examined a voluminous literature to trace the manual training, sloid, arts and crafts, and the industrial movements into the modern industrial arts concept with its contrasting philosophies, teaching methods and devices. Hansburg (603) studied the influence of printing upon the spelling, reading, and visual perception of special class elementary-school children. Thomason (668) analyzed certain school newspapers from the standpoint of the information furnished parents. Wall (673) sought the influences of improved farm practice, and Burton (576) described the effect of the restoration of ancient occupations and ceremonials upon the community life of an Indian tribe.

Experimental programs have been planned and applied by LaRue (623) to poultry raising, by Dolley (585) to a comprehensive variety of cooperative vocational training for senior high-school students, by Field (592) in instruction, and by Lyster (626) in integrating the various trades through the Little Theatre organization.

Thorndike and others (671) tested the prediction of vocational success by a long-time study of a large group of children. Dunlop (586) reported upon the out-of-school adjustments of non-academic boy graduates. Kent (618) directed a survey of graduates of a vocational school to obtain data of value in appraising and modifying the curriculum. Kennedy (617) surveyed the CCC units in Oklahoma to determine their facilities for industrial training. The causes of job satisfaction were explored by Hoppock (607); the household employment preferences of girls were determined by Tesh (662); the attitudes of girls toward certain occupations were studied by Sullivan (660); and subject motivating factors were analyzed by D. H. Price (648). Jeter (612) studied pupil population and local occupational opportunity to discover the number that might profit by specific training in a county vocational school.

Fryklund (597) defined the skilled mechanic; Koepke (621) studied the worker, his work and the machines operated in manufacturing plants; and Dvorak (587) applied a theory of unique traits to men and women workers in various occupations as a basis for differential ability patterns.

Informational content—Vocabulary studies were made by Kyl (622) in sheet metal and Clarke (578) in forging by the text analysis method, which was followed also by Miller (631) to determine topics for an elementary photography course, and by Evancho (591) for a course in mathematics

for auto mechanics. Related information for woodworking was studied by B. W. Spaulding (654) who compiled data from printed sources, and by Gard (598) who analyzed the material taught in junior high-school courses. Petway (644) gathered similar information with reference to general courses in mechanical drawing. Oberholtzer (638) defined problems of agriculture of value to all citizens, and presented generalizations concerning them obtained from worthy sources that may be helpful in curriculum units. R. Thompson (670) worked outward from a specific unit to the wide range of knowledges necessary for the solution of its problems.

Industrial surveys—The Stout Institute and the Wisconsin Industrial Arts Association have been conducting a statewide survey analysis of industrial arts which should soon be available. The Wisconsin Emergency Education Program for 1934-35 was traced by Weinke (674); industrial arts in central rural New York by Mann (628); industrial arts in West Virginia by Bailey (569); general agricultural education in Nebraska and Iowa high schools by Clayton (579); and ninth-grade mechanical drawing in the principal cities by Imboden (610).

Analyses and surveys have been made by Frasier (594) to predict the need for new workers in Iowa building trades; by Norris (636) on the numerical, occupational, and educational status of Kentucky negroes to provide a basis for their rational vocational education; by Ruley (651) for the purpose of planning courses in a local general industrial school; by Green (601) in establishing trade work operations; by Ellingson (589) to promote optimum individual student growth through the work of a technical institute; and by Colvin (580) to show the influence of agricultural education in stimulating interest and training in better farming.

That occupational changes are negligible and confined to detailed methods rather than major activities was shown by Ellingson (590). The increased burden placed upon schools by the depression to care for the out-of-school population was described by Hambrecht and Turner (602), and by Swanson (661). The influences of industrial change were considered by Klein (620) in a curriculum for the industrial arts. Fryklund (596) presented a program of training and selection for factory workers based upon their measurable traits and changing industrial conditions. Hoskins (608) set up standards from a study of selected young men engaged in farming to evaluate factors influencing a boy's opportunity of becoming a successful farmer and then applied them to a second group and evaluated the results. Cox (581) developed criteria for selecting schools and agencies offering vocational training of less than college grade, applied them to Baltimore, and accordingly compiled a directory of such agencies. Patty (643) found the "activity movement" preferable to the scientific movement in curriculum construction and discouraged the use of atomistically devised checklists and the atomistic manipulation of "content" curriculum materials. He considered the Bobbitt, Charters, and Peters approaches invalid.

Courses of study—Boyd (572) analyzed 177 courses as a basis for a form for courses of study. Moore (632) analyzed instructional units in a demonstration school in an effort to secure greater efficiency of instruction. Many courses of study have been worked out. Committees of teachers in New York State have developed various courses for the state department that are intended to serve general educational needs (635). They are worked out in such detail, with specific instructions to be followed, that if adhered to extensively will secure a degree of uniformity that is likely to defeat the purposes intended. Philadelphia teachers, likewise, have worked up various course materials of more vocational nature that have novelties of form, analysis, and presentation (645). Courses and curriculum materials were developed by Eastman (588) for students of pre-vocational agricultural science; by Livingston (625) in *Keene's Cement Craft*; by Breckenridge (573) in sheet metal for engineering students; Albaugh (566), Dickson (583), and Keene (616) in auto mechanics; Phillips (646) and R. H. Spaulding (655) in aviation; Aspinwall (568) in electricity; Gossett (599), Meyer (629), E. C. Price (649), and Ritter (650) in the garment trades; a state planning committee in Texas (667), Stephenson (656), and Wise (676) for the general shop; Buck (574), W. M. Jones (615), Kittle (619), and Schubert (653) in home mechanics and the home workshop; Buckley (575), Carroll (577), and Stigler (657), in farm practice; Benson (571) and John (613) in printing; Jenkins (611) in woodwork; French (595), Hastings (606), and Patterson (642) in drafting; Meyer (630) in oil burner installation and servicing; and Lientz (624) in operation sheets. Dignowity (584), and both the Texas Agricultural and Mechanical College (666) and the University of Texas (665) in cooperation with the State Department of Vocational Education reported upon foreman conferences. The University of Texas presented material for the training of laundry routemen (663) and a series of text and lesson units upon steam power, mathematics for oil field workers, motor vehicle driving, the care and operation of internal combustion engines, and janitor engineering (664).

Helpful bibliographies have been prepared by Gray and Hunter (600) upon the various technical and professional phases of industrial arts and vocational industrial education; by Hunter and Livingston (609) on professional articles; by McConnell and Applegate (627) upon acceptable devices and plans of procedure in a diversity of activities; and by Schmidt (652) upon leisure-time and avocational interests.

Needed research—There is a need for a unifying agency to collate the findings of the above studies in a form which will be readily available to all; there is need for a greater stress upon an educational point of view and "artistry" rather than an emphasis upon restrictive processes and information; and, finally, there is a need for research into the adaptability of new materials to educational service and suggestive activities discovered which may be used in utilizing these new, as well as old, materials for appropriate ability groups.

L. Mathematics

In the period from December 1, 1933, to December 1, 1936, little appeared that may be described as scientific research in the mathematics curriculum. Much that was written was of a theoretical nature rather than reports of the results of the application of statistical or experimental procedures. In the following paragraphs are summarized what appear to be the most significant reports published during the three-year period.

The objectives of mathematics instruction—The trend toward enriching and socializing the functions of instruction in mathematics, pointed out in the April, 1934, issue of the *Review of Educational Research,* has continued during the past three years. Three of the yearbooks of the National Council of Teachers of Mathematics have devoted considerable attention to restatements of objectives. In the Ninth Yearbook, Hamley (689) stressed the development of relational and functional thinking as an aim of mathematics instruction, and described a curriculum which, in his opinion, would accomplish this objective. In the Tenth Yearbook, Brownell (695:1-31), Buswell (695:74-84), Buckingham (695:51-73), and Thiele (695:212-32) discussed in some detail the importance of the informational and sociological functions of arithmetic. In that yearbook, Brueckner (695:32-50) presented evidence based on a survey of instruction in classes in Grades IV to VI in all parts of the country, showing that in over three-fourths of the classes socialization of subjectmatter received slight consideration. The development of skill in computation was the major objective in most classes. The Eleventh Yearbook (694) was devoted to the place of socialized mathematics in the curriculum. The necessity of considering the aims of mathematics instruction, as grouped under the computational, informational, sociological, and psychological functions, was discussed in *Educational Diagnosis*, the Thirty-Fourth Yearbook of the National Society for the Study of Education. The need of tests for measuring the extent to which the last three of these groups of objectives is being achieved by any class was pointed out. Brueckner (682) reported that tests of these four functions showed relatively low interrelations between computational ability and knowledge of social applications of number and ability to sense quantitative relationships.

The studies mentioned above clearly indicate the present tendency to vitalize and socialize the contents of the mathematics curriculum.

Organization and gradation of the curriculum—In a summary of the research by the Committee of Seven on the gradation of the contents of the arithmetic curriculum, Washburne (705) discussed the values and limitations of the work of the Committee. He also suggested what the nature of the organization and grade placement of the curriculum would be if based on the results of the investigations of the Committee of Seven. Simplification of the curriculum in the lower grades is clearly indicated.

Several important studies of the place of arithmetic in the "activity program" were published during the three-year period. Harap and Mapes published the results of two studies bearing on this problem. The first of

these (691) showed that processes with common fractions were learned with "85 percent mastery" when they were presented in a series of "activity units" in which their need arose as a part of the work on the unit. The processes were not presented in a logical, systematic order, but were taken up in the order in which they arose in the units of work. The second of their studies (690) dealt with the learning of processes with decimals in "activity units," in which the processes were taken up in the same way as in the fraction units. They reported that an experimental group achieved a "mastery of 96 percent of 27 basic processes" as compared with a mastery of 67 percent for a control group which was taught decimals in a formal, conventional way. White (708) showed the value of basing problems on situations in the child's experience.

Hanna (695:85-120), with the assistance of fourteen teachers in "activity schools," studied the extent to which number experiences arose in the activity work during a period of several months. Records were kept by the teachers. The results of the study showed that applications of numbers in the units used by these teachers occurred on the average of once in two days per class. An examination of the units of work used by the classes showed that they were not selected in such a way as to insure the applications of number. Hanna pointed out that it would be quite possible systematically to select "activity units" as valuable as those that were used by the classes in which the quantitative aspects of life would be given more adequate consideration, the plan used by Harap and Mapes to make certain that pupils would experience the application of fractions and decimals.

Few objective studies dealing with the gradation and organization of subjectmatter in secondary-school mathematics have come to the attention of the reviewer. Schaaf (700) made a questionnaire study of current practices in junior high-school mathematics and found no definite trend toward unification of courses in mathematics. Breslich (681) described a program of mathematics for Grades VII to IX with which he is experimenting, but no statistical findings were reported. Breslich (680) also described a procedure that may be followed to develop integration of courses in mathematics and science. Atherton (678) described a procedure for integrating mathematics and economics courses in "a progressive school." The third report of the Committee on Geometry of the National Council of Teachers of Mathematics (679) described six experimental curriculums for secondary schools based on "four variant philosophies" of teaching geometry in this country and in other countries. Wrightstone (709) showed that test results for two junior high schools with traditional separate subject curriculums were lower, but not significantly so, than for two schools having socialized, integrated courses in mathematics.

Genetic studies—The consideration being given at the present time to the reorganization of the curriculum in the primary grades has led to several studies of the uses of number in the experiences of young children. Russell (699) studied the role of insight in the development of certain number con-

cepts of children in the kindergarten and Grades I and II. Reid (698) studied the incidental number situations in first-grade classes having no formal arithmetic instruction. Many number experiences were found. Polkinghorne (697) reported the results of a survey of the knowledge of fractions for a group of 266 children below Grade IV. Wahlstrom (703), with the aid of a large number of teachers, made an analysis of the computational arithmetic of the social experiences of third-grade children, confirming other studies which showed the simplicity of arithmetic computations needed by children of this grade. Warren and Burton (704) reported the frequency with which children of the intermediate grades perform a series of business practices based on an analysis of adult activities, showing the relative infrequency with which children come into contact with, or use, these practices.

Gundlach (688) gave a series of comprehensive tests in the four processes in fractions to pupils in Grades VII to XII. The results showed a steady growth in addition, subtraction, and multiplication of fractions from grade to grade. In division of fractions, there was little growth from Grades VIII to XI. The groups of children, grade by grade, had approximately equal intelligence quotients.

Lindquist (692) reported that on the basis of results of the Iowa Every Pupil Achievement Tests in ninth-grade algebra "a significant proportion of pupils are incapable of deriving enough value" from the subject to justify requiring it of all pupils. Watson (706) showed the importance of recognizing in high schools the value of a course in commercial arithmetic for students who will undertake commercial courses in college.

Analysis of courses of study and textbooks—Wetherington (707) made an analysis of ten courses of study in arithmetic, nine of them rated as outstanding by the Curriculum Laboratory of Teachers College, Columbia University, showing wide variations in grade placement of topics. Metter (693) made an analysis of fifty-five arithmetic textbooks published between 1860 and 1933, showing the trends in the emphasis on various topics since 1860. Gunderson (687) analyzed the arithmetical expressions found in ten sets of readers for Grades I and II. Cowley (685) prepared a basic and a secondary vocabulary for plane and solid geometry. Distad (686) made an analysis of the drill provisions in division of decimals in ten arithmetic series, showing the variations in the frequency with which each of a large number of types of examples in that process appeared in the series examined. Urbaneck (702) and Olson (696) made detailed quantitative analyses of the contents of textbooks in ninth-year algebra. After presenting the results of an analysis of objectives of mathematics in textbooks and courses of study, Stelson (701) discussed the desirable contents of a course in business arithmetic for high schools, stressing the kind of mathematics there should be in a course to develop economic intelligence.

M. Science

Selection of course materials—From an analysis chiefly of the Thirty-First Yearbook of the National Society for the Study of Education and of

Downing's *Teaching Science in the Schools,* Hurd (716) secured a list of criteria for selecting and organizing subjectmatter in courses in science for elementary and secondary schools. He revised this list on the basis of criticisms by twelve experts in the teaching of science. He then had the criteria evaluated by twenty-one members of the National Association for Research in Science Teaching, and twenty-four members of the Central Association of Science and Mathematics Teachers, and twenty-one teachers of science in colleges and normal schools. The four criteria judged to be most important were these: to explain some scientific attitudes and to show how they affect man's thinking; to explain the methods of science and show how they operate in everyday life; to make an immediate and sustained appeal to pupils; and to encourage the belief in, and practice of, desirable social ideals involving science.

Koos (717) reported a study of the extent to which consumer science is found in high-school textbooks, including five in science. To 217 items taken from Harap's *Education of the Consumer* he added also 100 items from recent sources. He placed the resulting 306 items in 12 divisions. He then analyzed two textbooks in general science and one each in biology, physics, and chemistry, to determine the extent to which the topics of consumer science were mentioned (in a few sentences or less), were discussed (in at least two inches of type), or were presented as an exercise (in problems at the ends of chapters). He found the number of divisions recognized in general science, biology, chemistry, and physics to be respectively 6, 5, 3, and 4, and the number of items to be respectively 30, 26, 33, and 11. He found that the textbooks in the three special courses as a group recognize almost the same divisions as do the texts in general science, though there was evident "some tendency to differentiate . . . among the three courses. . . ." Koos concluded his report with this statement: "In addition to greater emphasis on these divisions, one might hope for more attention in all these courses to the protection of the consumer and the improvement of consumer literacy."

These two studies are especially significant because they represent progress beyond that of many older curriculum studies which presented only lists of topics to be taught; and because they present *criteria* for the selection of course materials, thus furthering the modern trend away from the teaching of facts as ends in themselves toward the use of facts merely as means to more important ends.

Scientific methods and scientific attitudes—Watkins (723) contributed an analysis of the types of scientific methods used by the layman in typical out-of-school situations. His findings were given in the form of "trainings which must be afforded in our schools in order to enable the citizen to apply scientific methods." Typical examples are these: training in the analyses of common and homely problems; in the location and definition of essential factors in a problem; in the interpretation of the significances of scientific experiments; in the recognition of, and the selection of, authorities; in the

use of reliable sources of scientific information; in discrimination between reliable and unreliable sources of information, etc.

The investigator stated that these trainings are valuable for both pupils and adults, and that they will not result fortuitously but can be assured only from direct teaching and practice. It is to be regretted that a study of such potential value and significance is marred by the superficiality of the technics employed in securing and analyzing the data.

Sixteen characteristics of scientific attitudes determined by the chairman, Ira C. Davis, of the Wisconsin State Science Committee (721) were submitted to 150 experienced teachers of Wisconsin and to 100 members of the National Association for Research in Science Teaching, the National Council of Supervisors of Elementary Science, and the Central Association of Science and Mathematics Teachers.

The final list of statements approved by the evaluators does not differ greatly from those reported in earlier investigations of the scientific attitudes, but this investigation adds validity to the earlier lists and makes some additional contributions to them.

Another significant investigation of scientific attitudes was the final one of a series by Caldwell and Lundeen (712), which presented convincing experimental evidence that superstitions can be effectively combated through the introduction into the curriculum of factual materials especially selected to show the fallacy in superstitions.

Elementary science—Robertson (720) synthesized the findings of ten investigations of principles of science. He refined the list of principles thus obtained, in accordance with the judgments of experts in subjectmatter and in the field of the teaching of science. The resulting 243 principles were then rated by 15 experts in the field of elementary science. The final list included "113 defensibly stated principles and subsidiary principles appropriate to serve as ultimate goals of science teaching in the elementary schools." This list is of primary interest and value to everybody engaged in preparing instructional materials for use in the elementary schools.

Haupt (714) made substantial progress toward establishing the practicability of the teaching of scientific generalizations in a carefully controlled study through the first six grades. He presented to the children phenomena and happenings as situations designed to secure interpretative reactions. He found that the children were able to generalize on all six grade levels, though the generalizations made on the lower grade levels were less complex than those made on higher levels. The investigator concluded that the difference between mental operations of children of the first and the sixth grades is not one of ability to generalize, but is one of relative complexity of generalizations they make.

The chief significance of these two investigations of curriculum materials in elementary science is the evidence they furnish of the increasing trend away from the determination of mere interests in science or topical objectives, and away from mere acquaintance with living things and from mere ap-

preciation of nature, toward the determination of scientific principles and broader curriculum objectives to which subjectmatter should ultimately contribute.

Biology—Webb and Vinal (724) analyzed the main headings, the topics, and the subtopics in thirteen courses of study in biology chosen from widespread sections of the United States, each a recognized curriculum center. They found that greater emphasis was being placed upon practical and interesting biology directly pertaining to everyday life and upon the social and economic aspects of biology than upon highly technical materials.

Generalized science for colleges—Winokur (725) made a study of the status of courses in generalized science in ninety-eight liberal arts colleges and universities, teachers colleges, normal colleges, and junior colleges offering such courses. Most of these institutions were giving the courses in response to a felt need, a state program, or the education program (the junior college movement). The objectives most frequently cited for these courses in generalized science were to give the student a general knowledge of subjectmatter of science, to acquaint him with the main generalizations of science, and to teach him to understand his environment. In contrast with the findings of Hurd's study (716) previously cited, understanding of scientific methods and appreciation of the scientific attitude ranked respectively fifth and sixth among the objectives. About half these orientation courses were of one year's duration; nearly a fourth were given in a half year. More than half these courses were presented by a combination of lecture and discussion methods; only about one in seven included individual laboratory work. In most cases the major subjectmatter emphasis was on chemistry, with the remaining time divided almost equally among astronomy, geology, and physics. Where biology was included, it received from one-third to one-half the time of the course. In about half these colleges the orientation course in science was required; in the others the number of students electing it showed a regular increase from year to year.

Important needs to be satisfied by curriculum investigations in the teaching of science are (a) a further refinement of ultimate and immediate objectives of science education through at least thirteen school years; (b) an improved integration of the entire science program; (c) further progress in measuring desired outcomes of science instruction; and (d) a defining of the nature, content, and placement of such needed courses in science as "consumer science" for the high-school pupil who will not attend college, "general physical science" to replace or to precede separate courses in physics and chemistry, and "advanced general science" for use in schools in which a three-year integrated course in general science is impracticable.

N. Social Studies

Social background and the nature of the social studies—Several volumes produced by the Commission on the Social Studies of the American Historical Association represent significant contributions to the field of social studies. In this series is the scholarly discussion by Beard (727) on the nature and

significance of the social studies. Bowman (728) likewise described the content and technics of geography and its relation to the social sciences. In a significant and well-documented report, Counts and others (737) portrayed the historical and contemporary background of the school and of the program in social studies. Bruner (729) reported the most common difficulties met in constructing socio-economic materials as follows: pressure of groups who fear discussion of modern problems, formal curriculum, parents' objections, legislation restraining freedom of expression, and insufficient background of teachers. Hess (755) compiled a list of common economic fallacies, constructed an economics reasoning test, and emphasized the need for combating common economic fallacies. The American Institute of Public Opinion (726) reported a poll of public sentiment on freedom of teaching, with 62 percent of those canvassed believing that schools should teach facts regarding all forms of government including socialism, communism, and fascism.

Extending the experiences of students—Hanna (750, 751) presented the results of a nationwide search for examples of the actual practice of good citizenship by youth in serving the local community. Enterprises in many communities are reported in which youth contributes to: safety, civic beauty, community health, agricultural and industrial improvement, civic arts, local histories and inventories, and protection of resources. In studying the activities of social science clubs in twenty-seven New York City high schools, Geduldig (745) found: membership open to all interested students; smooth functioning in spite of diverse views of members; such activities as debates, lectures, trips, and symposia. Levine (764) reported an experiment in which selected high-school seniors attended the broadcasting of "America's Town Meeting of the Air" in New York City, reporting back to their respective classes.

The program of studies—Tryon (781, 782) presented scholarly, documented reports on the past development and present status of the social sciences as subjects of instruction in the schools. After studying nearly 300 courses of study published during a two-year period, Harap (752) reported that the majority of social studies courses were consolidated, fused, or integrated, in marked contrast to the situation existing two years before. Gibbons (746) analyzed 39 courses of study produced between 1918 and 1933, finding a strong tendency to include world history in the twelfth grade. As the result of a questionnaire study, the Department of Superintendence of the National Education Association (774) presented data showing the frequency of course offerings and time allotments for social studies throughout the country. R. B. Clark (733) presented data on the objectives, content, methods, equipment, and teachers of geography in 10 European countries. Houghton (757) found some social science course other than history in 422 out of 518 cities and towns of Minnesota. An introduction to social science is offered in 404 communities. Most of the schools offer economics as a 12-week unit in some other course, only 24 schools reporting economics as a separate course.

Organization of courses—After constructing new tests in social studies, Wrightstone (786, 787, 790) evaluated results in schools exemplifying conventional and progressive practices. The textbook and topical approach was emphasized in conventional schools. Progressive practices included emphasis on current problems, the relating of information to pertinent problems, collateral reading, and discussion of civic attitudes and beliefs. He reported achievement approximately equal in the recognition and recall of social studies facts and in applying generalizations. The experimental school pupils were definitely superior in drawing inferences and in interpreting facts. They had better command of work-study skills and habits and were more liberal in their attitudes. Harap (753) analyzed twenty-eight college and high-school courses in consumption, and presented a table showing the various topics included. Lee and Root (762) attempted to evaluate the effectiveness of integrating social studies, English, and art in Grades VII and VIII. Several tests given at the end of the semester showed no significant superiority for either the experimental or control groups. Douglass and Pederson (740) compared the effectiveness of instruction in American history organized into units of three to six days in length with a daily study-recitation plan. They found that with well-trained teachers the former plan is slightly better and that it is probably better for bright than dull pupils. Swartz (779) described a method used in organizing a course in economic geography in which the industries to be included were determined by the value of the products and the number of workers employed.

Textbooks and materials—After securing data on American history textbooks most widely used, Farley (744) analyzed in detail the six high ranking books to show the amount of space devoted to each of six periods and to four aspects of history. He formulated lists of objectives indicated as most important by analysis of textbooks, courses of study, and reports of teachers. Kniss (760) asked history teachers and eleventh-grade pupils to indicate the characteristics which they preferred in tenth-grade history texts. Points deemed desirable were: sound scholarship and intimate acquaintance with high-school pupils on the part of authors, readily understood language and interesting style, student and teacher helps, study guides, maps, illustrations; emphasis upon general trends rather than mere facts, emphasis on modern history rather than ancient and medieval, more correlation with presentday problems, treatment of causes and results of wars instead of military events, and unit organization of subjectmatter. Clem and Ellis (735, 736) asked teachers to list sixteen American history textbooks in order of preference. After analyzing the preferred textbooks, they concluded that teachers desired: more space given to period since 1865, recent copyright dates, longer books, longer paragraphs, more illustrations, and more maps. They also presented data showing the relative emphasis given to different periods of history in the sixteen books.

Murra (773) analyzed textbooks in American history for intermediate grades, junior high school, senior high school, and junior college, finding

much repetition and similarity of treatment on different levels, and concluding that planned articulation was lacking. Levine (765) analyzed 13 high-school textbooks in American history. He found from 14 percent to 30 percent of the content devoted to the 15 major problems of American life presented in *Recent Social Trends*. Less than one-fifth of the space devoted to these problems deals with the period since 1918. About as much space is devoted to the wars in American history as to the 15 problems. Imperialism, immigration, and war are most widely considered. Problems of propaganda, race, women, arts, education, graft, and corruption are seriously slighted. Eleazer (742) reported two studies of textbooks. Twenty textbooks in American history which were analyzed included almost no reference to the services of negroes to America, their progress since emancipation, or their conditions and problems in recent years. Of 14 textbooks in civics and problems of democracy, 7 do not mention the negro and his problems, while the others give them slight consideration. Hann (749) analyzed textbooks in state history, finding that national aspects of state history occupied more than 50 percent of the books in four states, more than 25 percent in seven other states, and less than 25 percent in four states. The range was from 82 percent to 7 percent. Dewey (739) tested eighth-grade pupils on selections from 4 history texts. He found the pupils inadequately equipped in general background of experience to understand the material. He cautioned teachers not to place major emphasis on verbal presentations and verbal responses in teaching history at this level. Ward (783) found 2,912 different words in the first 106 pages of a recent history text for Grade VII. More than half of the words appeared but once, and 327 did not appear in Thorndike's list of 10,000 most frequently used words. Using the Lewerenz technic, W. W. Clark (734) analyzed the vocabulary difficulty of 77 social studies textbooks. His table included books ranging from grade placement of 3.7 to 9.5. Kepner (759) traced the development of textbooks in geography and history from 1874 to 1921. He pointed out the relationship of textbooks to major changes in education. Upon analyzing 13 standard texts in geography, Cain (730) found place geography emphasized much more than economic activities; subjectmatter content emphasized more than interpretation; and recall stressed more than thinking. Melbo and Waterman (770) analyzed the pictures in 8 series of geographies for Grades IV, V, VI, and VII. They found that pictures occupied 20 percent to 25 percent of the total space in the books; that the pictures included had little relation to the fundamental organization of materials; and that many pictures dealt with relatively insignificant relationships. Nickel (775) analyzed 12 introductory textbooks in economics published during the period 1899-1932. Topics given most space were, in order: exchange, money, and banking; production; distribution of wealth and income; labor organizations and economic reform; government finances; consumption. Koos (761) reported an unpublished study of Niehoff, in which 16 textbooks in sociology, political science, economics, and general social science were analyzed to show the extent and

nature of material on the consumer. A second study involved similar analyses of textbooks in other fields. Very slight attention to the interests and problems of the consumer was found in practically all of the books. Price (776) reported an investigation of the use of periodical literature in social studies classrooms. He found many teachers handicapped by lack of periodicals and time, while others reported skilful use of these materials.

Concepts—Kelley and Krey (758) presented a selected list of words deemed essential in history, and a longer list of terms expressing relationship in social studies. Experimenting with pupils in Grades VI, VIII, and IX, Chase (732) found that specific instruction in time and place relationships produced superior understanding of these relationships without sacrifice of factual knowledge, but that emphasis on facts in history does not result in increased control over time and place relationships. Michell (771) attempted to teach 25 social concepts to a group of fifth-grade pupils through incidental discussion of the concepts as they were related to the work of the semester. Such specific concepts as unemployment, wage-earner, labor union, and strike were learned by a majority of the class, while few or none mastered such inclusive concepts as economy of abundance, capitalism, and Industrial Revolution. Weede and Gilbert (784) selected 160 technical words from 1,050 in American history reported as essential by previous investigators. Pupils were tested at the beginning and end of the first and second semesters of the high-school course in American history. Their sampling test indicated that at the beginning these pupils knew 550 of the 1,050 important technical words, and that they learned 69 new words each semester. At this rate it would require seven semesters for them to master the remaining words in the list of 1,050, showing a definite need of instruction in the technical vocabulary of American history. Macomber (768) found that certain economic concepts and problems involving price, money, and banking, as now taught, are too difficult for the majority of high-school juniors and seniors with I.Q.'s under 115, although understandable by those above that level.

Attitudes and skills—Eckert and Mills (741) correlated international attitudes scores with several other factors in the case of 458 high-school seniors, finding that the more internationally-minded ones were superior in scholastic ability and achievement and more liberal in attitudes in other fields, also. Campbell (731) administered a test in international attitudes to 150 pupils before and after a semester in economic geography. The experimental group became more internationally-minded through an effort to understand various peoples and their problems, while the control group scored slightly lower in world-mindedness at the end. Wrightstone (788) studied the relationship between attitudes towards race, international affairs, national politics, and national achievements and seven other factors in 412 pupils in Grades IX to XII. He found a negligible correlation between civic beliefs and intelligence, and between civic beliefs and emotional stability. The number of social studies courses completed was no guarantee of changed atti-

tudes. A positive correlation was found between volume of current reading and liberal beliefs. Girls were considerably more conservative than boys. Longstreet (766) measured the change in attitude toward patriotism, the Constitution, and war produced in 250 juniors and seniors in classes in American history and civics in four high schools during one year's instruction. He found a definite change only in case the teacher made a special effort to produce changed attitudes. Rosander (777) correlated intelligence, personality scores, and information about the Constitution with attitude towards it, finding a small positive relationship between introversion and critical-mindedness, and almost none between information and attitude. He also found a small change in attitude caused by a twelve-week course in the Constitution. Grim (747) constructed a scale of beliefs to be used in determining the attitudes held by students in the following fields: militarism, nationalism, racialism, democracy, economic individualism, and labor and unemployment. A controlled experiment with two ninth-grade classes in a course in American government was carried on by Leggitt (763) to determine the value of specific lessons in study skills. After eighteen weeks of instruction, there was decided improvement in ability to use and apply the skills taught, the largest gain occurring in organizing materials and in use of books. Sorenson (778) gave 20 lessons in map interpretation to seventh-, eighth-, eleventh-, and twelfth-grade students. Before instruction the pupils thought of maps chiefly in terms of geographic facts. Afterwards they interpreted maps on the basis of relationships. Cropper (738) measured the effect of seven weeks of picture instruction on the ability of seventh-grade pupils to interpret pictures in geography textbooks and found that, after instruction, the pupils were more concerned with interpretation and problems of human behavior in contrast with major concern with purely factual materials previously.

Evaluation of outcomes—Kelley and Krey (758) reported a large number of new tests and of experiments in using them to evaluate the outcomes of learning in the social studies. Their volume is a significant contribution. In a follow-up study of graduates of New York City high schools, McKinney (767) reported that students gave evidence of being surrounded during their high-school years by highly patriotic influences, in literature, song, picture, assembly meetings, and plays. She reported a serious interest in civic problems and an attitude of inquiry and fairness in approaching them. Melbo (769) tested the information on contemporary problems and issues possessed by 4,348 seniors in 38 California high schools, finding them hampered by lack of information and misinformation and inadequately prepared to contribute effectively to rational consideration and attempted solution of current social, political, and economic problems. Welling (785) reported a survey by the National Self Government Committee of the reactions of 121 school superintendents of New York State, 70 percent of whom believed that future citizens were not being adequately trained for the responsibilities of citizenship. They recommended revision of the curriculum to provide more

emphasis on civics and more direct contact with politics and government. Ellis (743) showed, as a result of several tests, that freshmen entering college without world history in the high school scored almost as well as those who had taken a year's course, and that students who had studied the subject two years did comparatively little better. Houghton and Douglass (756) measured the initial background and the gain of pupils in a semester course in economics. Sophomores and juniors were found to make better average gains than seniors, leading them to conclude that juniors and at least the more capable sophomores should be permitted to enrol in the course. Farley (744) developed a comprehensive standardized test in American history, each item of which he considered justified by his analysis of textbooks and objectives reported above.

CHAPTER V
Activity Curriculums

IN REVIEWING THE RESEARCH on activity curriculums one must bear in mind that this movement was first rooted in philosophical considerations. With such an origin, naturally during the early period of development the contrasts and comparisons with the more standard type of learning procedure were in terms of philosophical discussions. Much more recently this activity movement has turned to a second source for its fundamental tenets, namely, organismic psychology. An increasing body of deductive literature may be found discussing the psychological and philosophical principles upon which this type of curriculum is based. A short list of the more useful works of this literature must include the following: Brim (794), Freeman (804), Kilpatrick (812), Mayhew and Edwards (815), and the National Society for the Study of Education (821).

The great bulk of the printed matter on activity curriculums is descriptive of classroom procedures. Vast quantities of reports have been printed during the past ten years with very little attention to the quality of the learning experiences described or to the quality of the reporting itself. Carey, Hanna, and Meriam (798) listed and classified over 7,000 reports of this kind printed to January 1, 1932. While no supplement to this catalog has been published, the amount of material appearing since the beginning of 1932 is undoubtedly more extensive than that reported above prior to 1932. Very little of this reporting has any suggestion of careful and critical evaluation of the results. For the most part it is the enthusiastic reporting by classroom teachers who have found a new joy and satisfaction in working with children in terms of personality development. One can only guess at the true nature of the learnings by noting the discussion of individual pupil growth associated with the described activities.

Statewide experimentation—Much more carefully written and for the most part much more critical of procedures and results are a number of state and city courses of study and professional books. The California State Department of Education published in 1930 a teacher's guide to child development (796). A great deal of experimental work preceded the publication of this volume in innovating "projects" or units of work with children of different grades and observing the general reaction of pupils, teachers, and parents, and testing the availability of materials. A companion volume has just been issued for the intermediate grades by the California State Department (797). Together these two volumes represent years of careful planning, try-out, elimination, revision, and elaboration. Another state department of education, Virginia (827), has published a tentative course of study designed to assist the teacher in developing activity curriculums. This volume is unique in the organization of the entire curriculum around basic social functions and child interests.

From the standpoint of combining description of actual activity curriculums and measurement of results, the series of publications by Lincoln

School of Teachers College, Columbia University is most comprehensive. One volume for each grade through the seventh describes in detail the learning experiences for the year and presents the evidences of growth. One of these volumes by Leining (814) reported the activities clustered around an interest in the solar system and the early ages of our earth's history. An extensive measurement program indicated these fourth-graders made more growth in science understanding than comparable pupils who had either studied a similar unit in the standard manner or who had had no experiences in this area.

Activity curriculums in schools—Both as an important historical document and as an excellent description of comprehensive activity curriculums, a recent volume (815) describing the school established by John Dewey in Chicago in 1896 is especially noteworthy. The opening and closing chapters of the book present the philosophy and the history of this earliest American activity curriculum. The bulk of the volume describes in detail the themes with which the pupils and staff experimented.

A large number of volumes have been written recently as general professional textbooks or guides to activity curriculums. Each such volume stated the theory and related considerable practice with scattering reports of original research on children's interests or objective evaluations. The more useful of this classification included volumes by Forest (803), Gustin and Hayes (806), Lane (813), Mead and Orth (816), Melvin (817), and Tippett (825). A similar volume was prepared by the New York State Association of Elementary School Principals (822); and the Department of Elementary School Principals of the National Education Association (820) has a section of its Fourteenth Yearbook devoted to this topic.

Activity curriculums are treated theoretically and practically in a volume by Caswell and Campbell (799), who have worked with seven state departments of education in developing this type of educational program. This volume summarizes their experiences and organizes the basic principles.

Evaluation of activity curriculums—In terms of a restricted definition of research it may appear that many of the materials cited above are not classified correctly as strictly research. The reviewer has included this type of general treatment inasmuch as the whole movement is comparatively young and just getting its philosophical and psychological bases well defined. It is typical of the life history of a movement of this kind that the more carefully defined experimental studies follow later. This movement has had some of this latter type of research reported, however. In the field of arithmetic, for example, Hanna and others (807) carried on research to discover the amount and kind of opportunity for the use of arithmetic in activity curriculums. Careful records were kept in six third-grade classes and six sixth-grade classes over a period of several months; all problems involving quantitative work were listed with the numbers and processes involved. These problems were analyzed to discover the spread over the four fundamental processes and the difficulty of the computations. The study indicated that a wide range of arithmetic was needed which gave rise to subsequent practice to

fix the facts involved. Harap and Mapes (808) reported that in a similar situation the experimental class of thirty-nine pupils in Grade VI, using only arithmetic in actual life activities, mastered 96 percent of the 27 basic processes in decimals incorporated in some 13 units, while a control class, using the conventional method, mastered only 67 percent.

During the past four years several studies have been made comparing the general subjectmatter learnings of pupils in activity curriculums with pupils in conventional curriculums. The results obtained by using standard achievement tests, corrected for native ability, were surprisingly uniform in showing that pupils in the activity curriculums do as well as and often better, on the whole, than pupils in conventional curriculums. Bruene (795), Collings (800), Crawford and Hale (801), Hopkins and Mendenhall (809), Howell, Dunn, and Stoker (810), Meriam (819), and Wrightstone (832) all agreed in these conclusions. All these investigations pointed out, however, that there are no adequate measures for the types of behavior patterns primarily stressed in the activity curriculums; such simple measures as these investigators were able to devise thus far indicate greater gains in such personality traits as initiative, cooperativeness, honesty, etc., for the pupils in activity curriculums.

Adams (791) conducted research to discover the major problems faced by teachers in initiating an activity program. The research developed some assistance in facing these problems.

Needed research—Activity curriculums to date have been given most attention in the formulation of basic principles and in innovating and pioneering in a new area of education. Thus far the more strictly research aspects of the problem have rightly been of secondary concern. The movement is undoubtedly sufficiently ripe for a great deal of research for refinement of technic and for evaluation of worth. Many studies of children's interests and normal maturation patterns under controlled environment are needed to indicate the nature of the activities. Many studies should be made to determine the nature of concomitant learnings as well as growth in the more obvious behavior of reading, writing, arithmetic, etc. The activity curriculums will come of age very rapidly when such research studies can be carried out in line with the basic tenets of the movement.

CHAPTER VI

Curriculum Surveys

THE TERM "survey," for the purposes of this chapter, is interpreted more broadly than is the case in the typical school survey of a state, city, or county system, so as to include a number of normative-survey analyses of courses of study and of the curriculums of public schools and higher institutions. Likewise a rigid definition of the term "research," in selecting curriculum studies for review, cannot be applied so readily as in dealing with more strictly experimental areas of investigation. The working classification of surveys employed in this chapter is as follows: (a) national, regional, or general in scope; (b) state; (c) city; and (d) county. Space limitations do not permit review of certain recent curriculum analyses or surveys in the special fields of dentistry, graduate instruction, theological education, forestry, nursing education, art, and music.

Surveys: national, regional, or general in scope—In a nationwide survey of curriculum problems concerned with the education of teachers, Rugg and associates (855) reported that traditional requirements, untested opinions, and instructors' judgments, without substantiation from research, are as yet too dominant in academic and educational curriculum prescriptions. They held that the teachers' curriculum should be an integrated one; that the content should be selected in terms of relative value for teachers as teachers, related to the demands and needs of better school practice, and based as far as possible upon research. In a summary statement in the National Survey of the Education of Teachers, Evenden (840) listed sixteen of the more fundamental principles which should control the education of teachers in this country and cited twenty of the more pressing problems to be solved. Appraisals of the curriculum problems in special fields, as parts of surveys of nationwide scope, were made by Roberts (842:472-74) in reading, Robinson (842:474-77) in arithmetic, Sueltz (842:477-80) in secondary mathematics, Reavis and Van Dyke (853) and Jones (847) in extra-curriculum activities, Brammell (835) in intramural and interscholastic athletics, Brammell (834) in health and physical education, Judd and others (849) and Tryon (861) in social studies, and O'Rourke (852) in English usage. As a part of a study of the vocational and industrial schools in fifteen cities of all sizes, Kefauver and associates (848) discussed programs for cooperative training in such schools.

Trillingham (860) secured data from 100 representative city school systems in order to ascertain and evaluate the practices and procedures used in organizing and administering curriculum programs. He found that 93 of the 100 cities had definite curriculum programs. Harap (844), after an analysis of over 300 courses of study on file at Teachers College, Columbia University, in the summer of 1934, concluded that they showed an increasing attention to the theoretical foundation of programs of curriculum revision and to the setting up of meaningful goals to direct pupil activities;

that courses were more functional; that units of work were based more and more upon social experiences; and that integration was a significant curriculum trend. In the yearbook of the National Society for the Study of Education on the activity movement, Gray and Ayer (850:167-82) analyzed the constituent elements in the curriculum, the basis of curriculum content, and the selection and organization of content. Geiger (843), on examination of the programs of study of 73 six-year high schools selected from all parts of the country, concluded that these schools generally offered an academic curriculum with music, art, commercial subjects, agriculture, home economics, and industrial arts as electives.

Deyoe (838) studied the catalogs and other printed material of 45 normal schools and teachers colleges in 33 states from 1902 to 1933 to analyze and interpret some of the trends in curriculum practices and policies. He found a noticeable tendency to provide offerings which prepare for broader fields of teaching and a tendency to lengthen and up-grade these offerings. Campbell and Smith (836), in a study of the institutions for training secondary teachers in the Southern Association, concluded that many important changes in the curriculum will be made in a comparatively short time. In a review of college surveys issued prior to April, 1933, Heston (845) pointed out some of the weaknesses in curriculum practices in colleges, and suggested that the curriculum be kept alive and changing to meet the needs of students. Foster (841), in an analysis of the curriculums of certain women's colleges, reported a need for reorganization in keeping with social change.

State surveys—The growth of statewide curriculum programs is illustrated by handbooks to be used as guides in the hands of teachers in the schools of Texas (858) and North Carolina (851). Soper (857), in a study of the small high schools of New York State, found their curriculums limited and ill-balanced, and suggested that they be reorganized to agree with experimental evidence obtained in small rather than in urban communities. The Tennessee Educational Commission (837), after a comprehensive study of its elementary, secondary, and higher public school systems, recommended a continuous curriculum-revision program, statewide in scope and comprehensive in nature. The *Ohio Survey of the Social Sciences* (854) is an analysis of the results of the "every pupil test" given in April, 1934, in Grades IV-VIII.

City surveys—The survey of the Cincinnati public schools (862) deplored the lack of local courses of study and the lack of uniformity of practice in the primary grades; it commended the general program of studies for the high schools, but suggested rather marked curriculum changes in the fields of vocational, atypical, industrial, and adult education. A survey of the Evansville, Indiana, public schools (859) commended the plan in use for revising the high-school curriculum, and recommended that a plan be worked out for continuous improvement and evaluation of the curriculum in the elementary schools. The Wellesley, Massachusetts, school survey (863) revealed a serious lack of attention to course of study revision in the elementary grades, but commended the efforts being made at the senior high-school level.

The Rutherford, New Jersey, school survey (839) commended the local program of curriculum revision of a few years ago; regretted the lapse in this effort; and recommended a carefully worked out program for its revival. A study of industrial education in the schools of metropolitan Boston (833) considered the curriculum in very general terms as related to the several trades. The Euclid, Ohio, survey (846) included an excellent chapter on the curriculum, in which were considered the elementary and secondary programs, courses of study, and instructional materials and practices, with a recommendation for a continuous program of curriculum study and revision as a remedy for the unsatisfactory status of instruction at Euclid.

A county survey—Smith and Noffsinger (856), in a survey of the rural schools of Monroe County, Indiana, pointed out some of the problems in curriculum making and practice in a typically rural section.

CHAPTER VII

Curriculum Investigations at the Teacher-Training, College, and University Levels

Nature of the Investigations

MORE THAN 500 curriculum reports on higher education were classified as to their nature. The frequency rank was:

1. Status (description, catalog, questionnaire, permanent record card, interview, personal correspondence, and trends)
2. Judgment (involving interpretative opinion based upon extended experience, canvass of opinion, and conference)
3. Experimental curriculums or courses
4. Evaluation (estimates, controlled experiments, tabulation of errors, canvass of test items, and canvass of textbook content)
5. Analytic determination of content (after some chosen pattern set-up)
6. Committee reports
7. Summaries of investigations
8. Studies of needs
9. Behavior studies

These involve status with historical background, analytic opinion, consensus, experimentation, and measurement. Objective standards are not high in most investigations. The trend toward objectivity and reflective thought will ultimately demand more factual data. Examination studies were not included unless definitely pertaining to the curriculum. Measurement of achievement is vital to the curriculum, however; with better measurement of educational outcomes, better curriculums will become possible. This is a review of published reports. A systematic canvass of all curriculum investigations would disclose many additional studies. The sections which follow and the bibliography refer to 228 representative investigations.

Liberal Arts Colleges

Reorganizations involving curriculum changes include rearrangement of offerings into larger learning areas (913, 1076); comprehensive courses (1007); orientation courses (1064); survey courses (1071); intensive concentration (913); honors courses (1000); independent study (1073, 1074); shortened periods (1022); seminars (913, 1031); tutorial instruction (1027); special courses (913); division of the four-year college into lower and upper (887, 913, 1003, 1008, 1031, 1070); integration of Grades XI to XIV (1022); curriculums adjusted to the individual (999, 1030); curriculums to prepare for living (999); cooperative study and vocational practice (999, 1060, 1062); and liberation from specific assignments (930).

Orr (1026) outlined a plan which developed the junior college curriculum from guiding principles. Koos (990) showed definite trends toward horizontal and vertical development. Hassold (971) described a seminar for superior seniors to "raid beyond the . . . frontiers of knowledge." Haworth (972) surveyed courses in education for marriage. MacLean

(1003) described courses designed to answer students' questions. Matherly (1007) described functional courses cutting across subject divisions. McHale (1000) cited trends in women's colleges toward functional living. Payne and Spieth (1030) listed trends toward orientation, specialization, individualization, and judgment of success by accomplishment.

Turney and Lee (1071) gave experimental data to show effects of exempting freshmen from new-type survey courses. Sontag (1060) and Stedman and Manson (1062) described vocational tryouts. Umstattd (1074) canvassed independent study and (1073, 1075) gave data on such courses at Minnesota. Boucher (887) described the Chicago plan. Other studies concern progress in the last decade (873, 947, 1012); relationships between training and vocational life (876, 975, 1058, 1069); students' interests and opinions (881, 920); accrediting standards (1023); the college product (910); the functions of a college (921, 923, 924, 961, 968, 978, 986, 1076); comparative difficulty of courses (1054); and alumni courses (992).

Bailey (876) showed that principals prefer teachers with liberal arts training. Bell (881) showed that freshmen ranked personality and health high as life objectives. K. I. Brown (894) described a plan providing for concentration on one course. Haggerty (1023) deduced principles to function as college accrediting standards. Coulter (920), from a student-opinion consensus, recommended a curriculum nucleated around life interests. Crane (921) described a curriculum as a process to insure individual development. Symonds (1065) canvassed student opinion for life problems and interests.

C. O. Davis (924) indicated trends toward more concentration. Gildersleeve (961) declared education a function of the teacher rather than subjects. Harap (968) showed increased offerings in consumer education. Humphreys (978) indicated that the Chicago plan gave broader preparation. E. S. Jones (986) reported an increase in early specialization. Kelly (989) showed vertical development more prominent than horizontal.

Junior Colleges

Carpenter (906) classified recent investigations. Barton (878) sketched trends in preparatory and terminal courses. Bennett (882) gave data on orientation courses. Chadwick (907) surveyed junior college curriculums in Minnesota. K. P. Walker (1080) showed the prominence of occupational courses in Mississippi. Webb (1084) indicated a lack in provisions for general education in California. Wilson (1090) utilized the concept of evolution to provide broad knowledge.

Bird, McDaniel, and Ewert (885) suggested a curriculum for social intelligence. J. P. Davis (926) recommended greater freedom in election in science. E. M. Jones (985) surveyed commercial education in 100 colleges. Zielbauer (1091) found general geology prominent. Warburton (1081) disclosed the value of a remedial reading course. McAlmon (997) and J. E. Williams (1088) described a plan to meet vocational needs. Eells (938) showed adult education in California in the pioneer stage.

General Academic Subject Fields

English and speech—Ament (868) described a method which built a liberal education upon an inclusive cultural synthesis. Appel (872) described a writing laboratory where students wrote naturally about interesting things. Bagley (875) reviewed an integrative experience curriculum in English. Clark (908) showed advantages of an informal plan in freshman English. W. H. Coleman (912) described favorably English survey and orientation courses. Eurich (943) showed advantages for intensive reading in freshman English. Hartnett (970) described writing and thinking in conjunction as mutual aids. Hoag and Bebout (976) measured outcomes in English. D. V. Smith and McCullough (1057) decided that grammar was not emphasized in English tests. Lyon (996) experimentally evaluated a developmental reading course. Steadman (1061) studied taboo words. D. C. Butler (900) analyzed errors in English. Bridges (890) discovered a demand for training in speech. Wiksell (1086) described a plan to care for individual difficulties in speech. O'Brien (1024) surveyed practices in debate contests.

Natural science—Allen (867) described a unified course in physical science environment. Gerberich and Roberds (960) favorably evaluated individualized instruction in college physics. Hyatt (981) demonstrated the ability of high-school pupils in college science. Rogers (1044) found effects of high school in college science courses. Shea (1052) surveyed science offerings. Bate (880) showed favorable influences of an orientation course in chemistry. Culbertson (922) devised a chemistry course to meet student needs. Dunbar and Tussing (934) canvassed student opinion on values of a chemistry course for those who had taken high-school chemistry. Hill (974) demonstrated the value of a short chemistry course for those who had high-school chemistry. Merwin (1011) found trends in chemistry toward technical, utilitarian, and cultural courses. P. O. Johnson (984) measured favorable concomitant outcomes in human biology. Tyler (1072) measured favorable outcomes of interviews and remedial instruction in college biology. Reinhardt (1039) showed a consensus favoring lectures in social hygiene.

Foreign languages—Fornwalt and Rogers (954) collected student evaluations of their college courses in foreign languages. Tharp (1067) reported researches in foreign languages. French (957) described a course: "France By Motor." Moore (1015) showed the need of a course in French literature. Tharp and his committee (1066) prepared a minimum French vocabulary. Price (1036) discovered errors in French state examination papers. Schlimbach and Jordan (1049) reported a successful course: "The German Language House." Stewart (1063) reported an experiment in German reading for science students. Nathan (1018) studied trends in Spanish teaching. Skinner (1056) prepared an Italian vocabulary list.

Miscellaneous—Krey (991) reported the preparation of a curriculum to supply a wide knowledge of society. McDowell (998) described an integrated course in the humanities. Binnewies (884) investigated effects of

higher education toward a scientific outlook. Ellis (941) measured permanence of learning in world history. Thompson (1068) summarized courses in college music.

Teacher Education

Curriculum building—Anderson (871) and H. A. Brown (893) outlined plans of faculty cooperation in curriculum construction. Harap (967) described a course planned by prospective teachers based upon discussion of economic problems and cooperative test construction. Painter (1028) analyzed examinations and classified topics. Peik and Rugg (1035) summarized instructor reactions to curriculum proposals.

Deyoe (929) ascertained trends in training institutions toward definite objectives, broader training, and lengthened curriculums. Pulliam (1037) formulated principles of curriculum construction. Jackson (982) traced changes in student-teaching curriculums. Siedle (1055) found increasing requirements, differentiated curriculums, and enrichment, with more attention to certification. Valentine (1077) listed propositions, objectives, and areas to be coordinated.

Subjectmatter divisions—Douglass (932, 973) summarized studies of secondary teacher preparation, recommending broad training, specific specialization, and longer curriculums. W. S. Gray (973) indicated trends in curriculums for secondary teaching—recognition of interests and needs, extension of general education, breadth, depth, and culture. Cahoon and Mackay (903) summarized teacher opinion favoring longer training, methods of disciplining, correlation of theory and practice, and stress on attitudes and interests.

Boone and Jameson (886) showed inadequacies in preparation of science teachers. Hurd (980) showed what science teachers understood by subjectmatter professionalization and listed examples of integrated courses. Watkins (1082) surveyed the Missouri high-school science market and found a demand for wider training. Brechbill (889) favorably evaluated a course in science teaching. R. Gray (963) gave patterns of training for chemistry teachers in selected institutions.

Robinson (1042) surveyed professionalized courses in arithmetic and decided it was not a recognized professional field. Butterweck (902) described the Temple University system for training art teachers. Aderhold (865) summarized times, methods, and aims in agricultural education. Lindahl (993) summarized opinions of industrial-art training teachers. McHenry (1001) surveyed curriculums, staff, and equipment in industrial art. Humphries (979) canvassed the training of foreign language teachers. Ehrenhardt (939) based needs in business-education training on present status, philosophies, and objectives. Guffey (965) studied commercial teaching and recommended needed training. Peik and Fitzgerald (1033) surveyed curriculum patterns for men teachers of physical education. Rugen (1045) recommended desirable training for physical education teachers. Maus (1010) concluded that English teachers need more and wider train-

ing in recent and adolescent literature, extracurriculum activities, mechanics, and remedial work. J. C. Johnson (983) summarized training for English teachers in selected institutions. Edman (937) gave patterns of work taken by prospective English teachers. Mitchell (1013) outlined an experience curriculum in the social studies. Delander (928) summarized content of special-methods social studies courses. Moulton (1016) recommended work for secondary mathematics teachers. Fishbaugher (950) surveyed mathematics special-methods courses. Weis (1085) surveyed training in music education and submitted programs for rating. Roemer (1043) studied teacher extracurriculum duties and training for them. C. O. Davis (925) surveyed training for junior high-school teachers. Shannon (1051) and Burke (898) surveyed training for secondary-school principals. Jorstad (987) studied needs of rural teachers. Bartsch (879) secured alumni evaluations of rural education courses.

Professional courses—Evenden (944, 945) outlined phases of professional education, and discussed the "blend method" of professionalization. Good (962) summarized objective data regarding education, psychology, and professional courses. W. S. Gray (964) presented significant material on preparation of secondary-school teachers. Linder (994) studied duplication in education courses and how teachers used the topics. Garber (959) discovered little uniformity in courses in secondary education. Williamson (1089) showed the need for a unified course in general theory. Burton and Ibanez (899) investigated similarities in textbooks in education. Eckert and Jones (936) evaluated a "how-to-study" course. Fairchild (946) showed the importance of general and professional courses. Bachman (874) emphasized general education. Brandenburg and Trimble (888) obtained administrative consensus favoring professional courses. Mathews (1009) investigated content in educational measurements. H. M. Walker (1078) surveyed practice in statistics courses and outlined content for various levels of need. Harris (969) disclosed need for non-professional library courses.

Integration of theory and practice—F. A. Butler (901) described a plan of "learning to teach by learning to learn." Collins (914) secured favorable student opinion on practice teaching. Rugg (1046) showed relations between training and laboratory schools. Sherrod (1053) summarized practice teaching in better institutions. E. I. F. Williams (1087) indicated actual and potential use of laboratory schools. The faculty of Teachers College, Columbia University, appraised the first four years at New College (915).

Miscellaneous—Moffett (1014) canvassed graduate teachers to discover needed curriculum readjustments. Parsons (1029) surveyed colleges to formulate training standards. Peik (1032) summarized curriculum investigations in higher education. Peik (1034) compared training in teachers colleges, and colleges and universities. Rugg and others (1047) reported extensively on curriculum practices in teacher education. The Twenty-Third Yearbook of the National Society of College Teachers of Education (1019) summarized principles of curriculum construction and directed teaching.

The Fifteenth Yearbook of the American Association of Teachers Colleges (870) discussed lengthened curriculums, graduate study, educational level, teacher preparation, professional elements, sequence, and administrative opinion.

Curriculums in Professional Schools

Engineering—Barnes (877) suggested new emphasis in time and motion study in manufacturing. Eidmann (940) considered problems in machine design requiring invention. Fife (948) described a course in technology and civilization. Naeter (1017) outlined a new curriculum in general engineering. Finch (949) outlined new courses involving engineering economics. Guild (966) compared textbooks to contrast viewpoints of liberal arts and engineering economists.

Biegler (883) summarized opinion on the feasibility of a five-year engineering curriculum. A curriculum committee of the Society for the Promotion of Engineering Education (1059) classified needs and opinions. A conference on chemical engineering (919) reported practice, emphasized aims, and discussed new courses. Doherty (931) outlined the Yale program to accomplish engineering objectives. Draffin (933) traced engineering trends in instruction. Fuller (958) compared civil engineering curriculums. Weaver (1083) surveyed mathematics courses. Frazier (955, 956) described comprehensive examinations for honor students and stressed correlation and integration.

Medicine—Ackerly (864) conducted an experimental course in psychiatry. Ebaugh (935) outlined an ideal curriculum in psychiatry. Clarke (909) surveyed professional training of the hospital dietitian. Brooks (891) described a coordination of fundamental sciences and clinical branches. Cannan (904) outlined a practical pre-medical curriculum in the physical sciences. Kampmeier (988) outlined a correlated course in human morphology. Macklin (1002) disclosed needed correlation between histology and pathology. A. Brown (892) explained applications of theory in pediatrics. Cannon (905) sketched the history of "social case teaching." Fitzgerald (951) described opportunities of medical students in a health department. Robb (1041) analyzed discrepancies in medical textbooks.

Dentistry—Studies centered around the Report of the Curriculum Survey Committee of the American Association of Dental Schools (869). This summarized oral health conditions, developed objectives therefrom, and outlined courses to accomplish the objectives. Aisenberg (866) described content in oral medicine and in other pre-dental and dental courses. Flagstad (952) summarized status in partial denture prosthesis.

Pharmacy—Investigations centered in the American Association of Colleges of Pharmacy. A conference (918) resulted in six papers on theory, new and non-official remedies, contacts with physicians, pharmaceutical mathematics, and a four-year curriculum comparison. A conference in pharmacology (917) resulted in two papers: consensus on content of a

pharmacognosis course; and use of the term "materia medica." DeKay and Lee (927) compared present with former courses in twenty institutions.

Journalism—O'Dell (1025) traced the history of journalism education.

Law—Investigations centered in the American Association of Law Schools. Reed (1038) gave data on curriculums in various schools in a review of legal education. Burdick (897) described a project in comprehensive examinations. McMurray (1005) surveyed courses in legal history.

Business—Ford (953) analyzed researches in business education. P. E. Coleman (911) compared graduates of the cooperative plan with conventional graduates and listed advantages of the former. Ericson (942) described courses to meet new demands in business.

Religion—W. A. Brown and others (896) surveyed education for the ministry and recommended curriculums. A committee from midwest Lutheran colleges (916) outlined elements of a Christian general education.

Prominent Curriculum Concepts

An objective tabulation of concepts prominent in all investigations yielded sixty-six concepts indicating the need for a synthetic treatment to bring unity and coherence of effort from the variety of viewpoints exhibited. The following generalizations are representative condensations in the order of frequency found:

1. **Changing life and knowledge necessitate continuous curriculum change.**
2. **Curriculums depend fundamentally upon their purposes, objectives, and functions.**
3. **Individual growth and development are controlling curriculum objectives.**
4. **More and better curriculum research, experimentation, and evaluation are needed.**
5. **Broad, distributed, comprehensive curriculums are basic to distinctly specialized curriculums.**
6. **Correlation between theory and practice is a vital consideration.**
7. **Organization and departmental division are important features of curriculum operation and function.**
8. **Basic principles should guide the solution of specific curriculum problems.**

Concluding Comments

The reviewers have been impressed with large-scale experimentation in progress. Indications are that early piecemeal research is giving place to a growing recognition of the importance of basic curriculum study. Major effects of the measuring movement are visible in the interest and enthusiasm being shown for experimentation itself. Numerous and detailed studies on subsidiary problems have borne fruit in pushing into the foreground the necessity for basic institutional changes affecting the whole curriculum fabric.

Another and related tendency is toward the establishment of organizing centers for cooperative curriculum research in various institutional and subjectmatter fields. There are national organizations now representing many major fields. The concentrated efforts of large groups cooperating to further common objectives cannot fail to bring ultimate knowledge useful in solving problems of the whole.

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